STATE OF NEW HAMPSHIRE INTER-DEPARTMENT COMMUNICATION

FROM Richard M. Lane Engineering Geologist

DATE September 20, 2010 **AT** Materials and Research

SUBJECT Geotechnical Baseline Report

Replace US Route 3 Bridge over the F. E. Everett Turnpike

Bedford 13527

TO Alex Vogt Project Manager

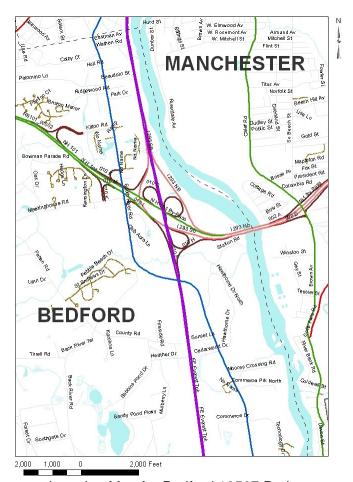
This report presents the results of our geotechnical baseline evaluation for the replacement of the US Route 3 bridge over the F. E. Everett Turnpike project in Bedford NH. Information in this report is subject to the limitation stated in Appendix A. The following sources were used in the preparation of this report:

- Preliminary Geometric Base Plan for US Route 3, scale 1 inch = 50 feet, dated June 11, 2010.
- Preliminary Proposed Cross Sections for US Route 3, scale 1 inch = 20 feet, dated June 11, 2010.
- Proposed Profiles for US Route 3 and Station Road, dated June 11, 2010.
- Proposed Future F. E. Everett Turnpike Expansion Plans and Cross Sections, dated June 14, 2010.
- Draft Engineering Report for the Bedford 13527 project, dated June 30, 2010.
- Sriramadas, A. 1966, Geologic Map and Structure Sections of the Manchester Quadrangle, New Hampshire, scale 1:62,500.
- Hillsborough County, New Hampshire, Eastern Part, United States Department of Agriculture, Soil Conservation Service, issued October 1981.
- Koteff, C and Stone, B, 2000, Surficial Geologic Map of the Manchester South Quadrangle, Hillsborough and Rockingham Counties, New Hampshire.
- NHDOT Rock Slope Management Database.

Engineering units used herein refer to the English system. Elevations and stations are in feet. The station series listed below, which are shown on Figure 1, represent the approximate centerline of the existing roadways included in the project. The existing US Route 3 centerline is the basis for information presented in this report.

- US Route 3, Sta. 100+00± to Sta. 136+00±
- Station Road, Sta. 200+00± to Sta. 205+00±

1. <u>Site Conditions</u> – The project site is located where US Route 3 crosses over the F. E. Everett Turnpike in Bedford, NH. This segment of US Route 3 generally runs from west to east, crossing diagonally over the F. E. Everett Turnpike and then curving south toward the end of the project. The Turnpike alignment is oriented in a south to north direction cutting into bedrock on both the east and west sides of the Turnpike including the US Route 3 bridge area. The existing bedrock cuts on both sides of the Turnpike extend approximately 200 feet to the north of the bridge to where the NH Route 101/I-293 northbound off–ramp and the southbound on-ramp diverge and merge, respectively, with the Turnpike. The existing bedrock slopes on both sides of the Turnpike south of the US Route 3 bridge extend approximately 1,000 feet south of the bridge with the cut slopes reaching a maximum height of 65± feet. The rock slopes on both sides of the Turnpike are designated as rock cut 168R in the NHDOT Rock Slope Management Database.



Location Map for Bedford 13527 Project

1.1 <u>U.S. Route 3</u> – The Lowe's Home Improvement Center and Target Stores are on the south side of US Route 3 at the western end of the project. Lowe's is located above the Turnpike rock cut on the west side of the southbound highway, adjacent to the State right-of-way (ROW). Bedrock is also exposed along the south side of U.S. Route 3 in front of Lowe's, just west of the bridge. Station Road intersects US Route 3 on the north side of the road, just east of the bridge. East of the bridge there are several scattered outcroppings of bedrock along the south side of US Route 3 in the vicinity of the Country

Inn & Suites and on the north side of US Route 3 in front of the Bedford Hotel. The Country Inn & Suites is located along the ROW on the south side of US Route 3, above the Turnpike rock cut on the east side of the northbound highway. Construction for the hotel building and parking lots involved excavation of bedrock resulting in a rock cut (estimated 15 to 20 feet in height) behind the hotel and along the ROW boundary. Based on the borings and field observations, bedrock is expected to be shallow along U.S. Route 3 and then drop off in elevation as the road turns toward the south on the east end of the project. Bedrock was not encountered in the borings (B32 through B35) taken at the intersection of Hawthorne Drive and in the two roadway borings (B36 and B37) taken further to the south.

A portion of the US Route 3 alignment appears to have been located approximately 50 to 100 feet further south of the existing roadway prior to the construction of the Turnpike. There are overhead utility lines that cross over the Turnpike south of the US Route 3 bridge with poles located on the State ROW above and behind the existing rock slope in this area. There are aerial utilities throughout the project site consisting of power, telephone, and cable. Buried water and gas lines are located within the project limits, but do not cross the existing bridge.



Picture #1 – East abutment of bridge founded on bedrock



Picture #2 – West abutment of bridge founded on bedrock with water seeping from weep hole

- 1.2 U.S. Route 3 Bridge over the F. E. Everett Turnpike The US Route 3 bridge (NH Bridge No. 189/121) was constructed in the 1950's when the F. E. Everett Turnpike was built. The bridge is approximately 40 feet wide and 150 feet long and crosses with an alignment skewed from perpendicular to the Turnpike. The bridge itself is straight with structure bearing lines parallel to the Turnpike. The existing abutments are perched on bedrock above the roadway elevation of the Turnpike (Pictures #1 and #2). The bridge has two spans with a central pier in the median of the Turnpike. The pier has a spread footing founded on or near the bedrock surface. Short wingwalls extend from the four outside corners of the bridge diagonally, and these are also founded on or near bedrock.
- 1.3 <u>Bedrock Slopes on F. E. Everett Turnpike</u> The rock slopes on both sides of the Turnpike south of the overpass bridge were originally constructed by blasting with large production shots and without pre-split holes, causing much over-breakage. The bedrock exhibits extensive jointing and fracturing in the cut. Freeze-thaw action and weathering of the exposed rock have been occurring since the cut was opened. In 1993, the rock cut slopes north of the bridge were pre-split, cutting the rock further back from the road

to accommodate work on the Exit 3, NH Route 101/I-293 interchange ramps. The newer pre-split slopes merge with the old production shot rock slopes just north of the US Route 3 bridge (Pictures #3 and #4).



Picture #3 – Turnpike northbound highway east side pre-split slope, view from bridge looking north toward NH Route 101



Picture #4 – Turnpike southbound highway west side pre-split slope, view from bridge toward NH Route 101 interchange



Picture #5 - Pocket of weathered rock on west side of Turnpike southbound highway, south of the bridge

The exposed bedrock in the cut slopes along both sides of the Turnpike is primarily gneiss and granitic gneiss with intrusions of pegmatite (coarse grained granite). There are some pockets and seams within the bedrock, particularly in the pegmatite, which have weathered to a soil-like consistency (Picture #5). Weathered rock was also encountered in segments of recovered rock cores from some of the borings (Refer to Appendix C). A steeply dipping joint set in the vicinity of the bridge runs nearly parallel with the alignment of the Turnpike. A sub-horizontal set of joints was observed in the existing rock slopes on both sides of the road. The sub-horizontal joints are primarily

shallow stress relief joints within 10 to 20 feet of the ground surface. When discernible, the foliation in the gneiss generally strikes in a southwest to northeast direction and dips steeply to the northwest or southeast. Some folding of the light and dark bands in the gneiss were observed. There are other joints exposed in the rock slopes, some are discontinuous and short in length.



Picture #6 – West side of Turnpike concrete barrier with no ditch, view looking south toward the bridge



Picture #7 - Rock slope irregular slope on east side of Turnpike, northbound highway south of bridge

A double beam guardrail runs along the edge of the pavement for the entire length of the rock cut on both sides of the Turnpike, except for short segments of concrete barrier under the bridge (Picture #6). The guardrail serves a dual purpose, to keep straying vehicles from hitting the rock face and to keep rock fall from reaching the road. The existing rock slopes on both sides of the Turnpike are irregular in profile, and uneven along the roadway alignment (Picture #7). There are overhanging blocks and slabs through the rock cut. The irregular slope profile throughout the cut provides numerous launching pads (i.e. deflection points into the road) for potential rock fall.

2. Project Description – The project begins at the intersection of US Route 3 and the Target/Lowe's drive, and runs in an easterly to southerly direction along US Route 3 for approximately 0.6 of a mile. The proposed preliminary project scope of work as envisioned by the NHDOT includes replacing the US Route 3 bridge with a new structure located north of the existing bridge, construction of a revised US Route 3 alignment to accommodate movement/replacement of the bridge, and widening of the bedrock cut along the F. E. Everett Turnpike in the vicinity of the bridge to accommodate the future addition of two lanes on both sides of the Turnpike (northbound and southbound highways). In addition, the proposed project includes a retaining wall in front of the Spine Realty Building on the north side of US Route 3, four mast arms at the Hawthorne Drive intersection along US Route 3 on the east end of the project, several detention basins and closed drainage systems throughout the project.

At present, three drainage treatment areas are proposed for the project as shown on Figure 1 on the north side of US Route 3. The first site is immediately west of the Turnpike, the second site is in the middle of the project, and the third site is at the eastern end of the project. Bedrock was encountered in the borings (B07, B08, B25, B38) taken in the vicinity of the proposed treatment sites. Bedrock excavation may be required at all the proposed basin locations. Extensive proposed closed drainage systems are also shown on Figure 1. A high bedrock surface was encountered in many of the test borings, indicating that bedrock excavation may be required for drainage system installation throughout portions of the project (Refer to Table 1 - Summary of Explorations and Boring Information).

Excavation of the bedrock along the Turnpike for future widening is expected to extend the full length of the existing cut north of the Route 3 bridge and a minimum of 150 feet south of the US Route 3 bridge. This will allow future widening of the Turnpike and provide a buffer to minimize possible damage to the new bridge from future blasting activities. The rock cut widening is expected to provide a stable rock slope and a ditch that can accommodate the full width Turnpike and potential rock fall. This work may impact the existing overhead sign structure located south of the bridge, requiring its replacement. The rock slope work is not expected to require additional ROW, but this should be reviewed with the final design.

3. <u>Subsurface Explorations</u> – Subsurface explorations conducted for this project include 42 test borings, labeled B01 through B42, completed in 2010 by NHDOT exploration crews. The exploration locations are shown on the attached Subsurface Exploration Plan (Figure 1) and also shown on an attached GIS photomap (Figure 2). Douglas Rogers, NHDOT Staff Geologist, supervised the field explorations and completed the logs. The test boring logs are contained in Appendix B, and a summary of their results is contained in the attached Table 1.

The test borings were conducted with drill and wash methods. Standard Penetration Tests (SPT) were conducted in the test borings according to AASHTO T206 standards. The SPT consists of a 1-3/8 inch inside diameter sampler driven in 6-inch increments, using a 140-pound hammer dropped 30 inches. NX size (1-7/8 inch) rock cores were also obtained in many of the test borings. The locations and associated elevations of the test borings were determined in reference to survey points in the field that were established by the NHDOT Survey Section. The soil samples and rock cores retrieved in the exploration program are stored at the NHDOT Materials & Research building in Concord for viewing. Pictures of the rock cores can be provided upon request.

The existing asphalt pavement on US Route 3 and Station Road was cored with 6-inch diameter cores being retrieved. The existing asphalt pavement ranged in thickness from 7 to 9-1/4 inches in the five cores taken on US Route 3, and it was 2 inches thick at the one core taken on Station Road. No evidence of concrete pavement was found at any core location. The pavement core report is enclosed in Appendix C. The pavement cores are stored at the NHDOT Materials & Research building in Concord for viewing. Pictures of the pavement cores can be provided upon request.

- **4.** <u>Subsurface Conditions</u> This section summarizes a general description of the soils and bedrock encountered in the subsurface explorations. Segments of published geological maps showing the general surficial and bedrock geology in the project area are included in Appendix D and Appendix E, respectively.
 - **4.1** <u>Soil and Bedrock Conditions</u> Subsurface deposits include the following strata, presented in the general sequence they would be encountered proceeding downward from the ground surface. Any one or several units may be absent or in a different sequence at specific locations in the field. The exploration logs should be referenced for a more detailed description of subsurface conditions at their specific locations.

<u>Topsoil</u> – When encountered the topsoil layer was generally fibrous to loamy or silty fine sand to fine sandy silt with the thickness ranging from approximately from 0.2 to 0.7 feet.

<u>Subsoil</u> – This layer is the transition zone between the topsoil layer above and the natural mineral soils below. The general description includes fine sand and silty fine sand/fine sandy silt with lesser amounts of medium to coarse sand, gravel, isolated cobbles and organic fibers. The density generally ranged from very loose to loose.

<u>Miscellaneous Fill</u> – This deposit represents materials placed during previous site development work, which includes the existing bridge and roadway facilities, and underground utilities. The miscellaneous fill in the test borings generally consisted of fine to coarse sand, gravel and fine silty sand with a variable mixture of silt, gravel, cobbles, isolated pieces of asphalt and occasional wood fragments. The density generally ranged from very loose to dense.

<u>Glacial Fluvial</u> – This deposit represents materials deposited in meltwater streams during the later stages of glacial regression. The material is sorted and stratified. The general description includes fine to coarse sand, silt and silty fine sand with lesser amounts of gravel. The density generally ranged from loose to medium dense.

<u>Glacial Lacustrine</u> - This deposit represents materials that are generally fine textured sediments deposited in a glacial lake environment. This deposit was silt with little to trace clay. The density of the cohesive soil was generally stiff.

<u>Glacial Till</u> – This deposit represents materials deposited by the advancing glacial ice directly above the bedrock surface. The general glacial till descriptions included silty fine sand and fine to medium sand. Lesser amounts of coarse sand, gravel and silt were part of the soil matrix. Cobbles and weathered rock fragments were encountered throughout the deposit. The density generally ranged from dense to very dense.

<u>Bedrock</u> – The general bedrock types that were encountered for this project are gneiss and granitic gneiss with pegmatite and granite intrusions. The individual boring logs (Appendix B) should be referenced for information regarding the hardness, fracturing, weathering, mineral composition and rock quality designation (RQD) of the bedrock cores. The bedrock classification method is contained in Appendix F.

4.2 <u>Laboratory Test Results</u> - Grain size distribution curves for selected soil samples taken from the borings are included in Appendix G (Laboratory Tests).

Sincerely,

Richard M. Lane, PG, CPG Engineering Geologist

Charles Dusseault, PE Geotechnical Chief

Enc: Appendix A - Geotechnical Baseline Report Limitations

Appendix B - Test Boring Logs B01 through B42

Appendix C - Asphalt Core Report

Appendix D - Segment of the Surficial Geologic Map of the Manchester South

Quadrangle

Appendix E Hillsborough and Rockingham Counties, New Hampshire Segment of the

Geologic Map and Structure Sections of the Manchester Quadrangle,

New Hampshire

Appendix F - Visual-Manual Identification of Rock

Appendix G - Laboratory Tests

Att: Table 1 – Summary of Test Boring Information

Figure 1 - Subsurface Exploration Plan

Figure 2 - GIS Photomap

cc: David Reimers, Bureau of Construction
Charles Dusseault, Bureau of Materials & Research

Table 1
Summary of Test Boring Information

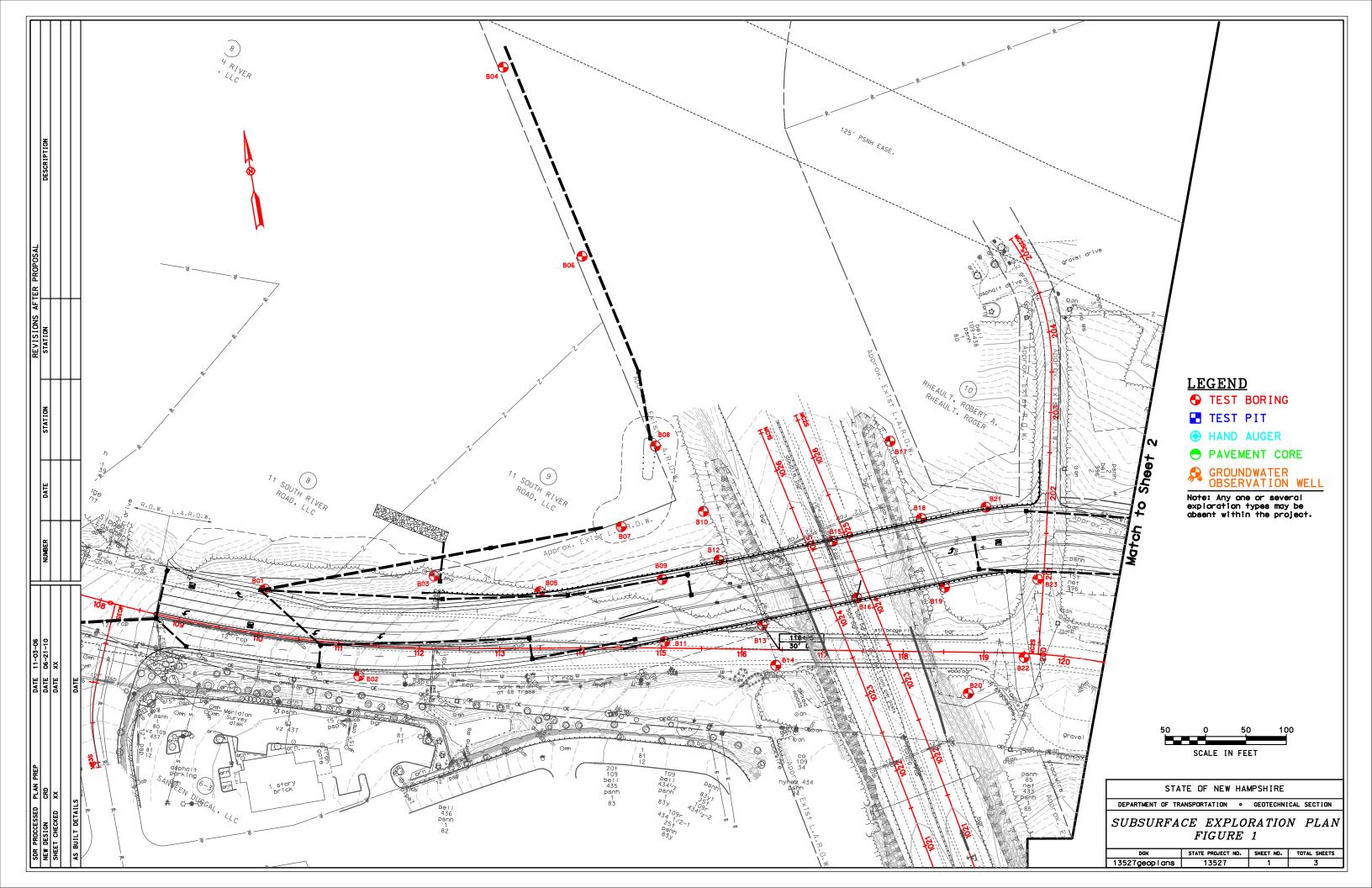
Exploration ID	GPS Coordinates (easting/northing)	Station & Offset	Depth of GW	Elevation of GW	Depth of Asphalt	Depth of Topsoil	Depth of Subsoil	Depth of Fill	Depth of Glacial Fluvial	Depth of Glacial Lacustrine	Depth of Till	Depth of Bedrock
B01	1036132/161467	109+99, Lt 56	7.5'	212.6		0-0.5'		0.5-2.0'			2.0-6.5'	6.5-12.9'+
B02	1036229/161341	111+28, Rt 39	5.6'	224.1		0-0.3'		0.3-8.7				8.7-13.5'+
B03	1036341/161448	112+17, Lt 90	1.9'	222.8		0-0.5'						0.5-5.3'+
B04	1036530/162056	113+10, Lt 720	Dry	N/A		0-0.3 '	0.3–1.0 '					1.0-5.8' +
B05	1036467/161407	113+50, Lt 70	4.9 '	229.4		0-0.3'	0.3–1.5'					1.5-6.5 '+
B06	1036588/161809	114+05, Lt 485	Dry	N/A		0-0.2'	0.2-2.0'				2.0- 12.0' +	
B07	1036580/161470	114+50, Lt 150	5.0'	225.1		0-0.4'	0.4–0.8'					0.8-5.6'+
B08	1036638/161562	114+90, Lt 250	6.9'	213.2		0-0.3'	0.3–1.0'				1.0-3.4'	3.4-8.2' +
B09	1036619/161397	115+00, Lt 85	6.0'	231.1		0-0.4'	0.4–1.0'				1.0-4.6'	4.6-9.4'+
B10	1036684/161472	115+50, Lt 170	15.1'	216.0		0-0.3'	0.3–1.0'				1.0-3.1'	3.1-31.6'+
B11	1036610/161321	115+04, Lt 08	7.3'	234.0	0-0.7'			0.7-3.8'				3.8-8.9'+
B12	1036693/161409	115+70, Lt 110	15.8'	223.0		0-0.3'	0.3–1.0'				1.0-4.5	4.5-35.0'+
B13	1036733/161321	116+25, Lt 30	5.3'	236.6		0-0.4'		0.4–0.5				0.5-33.0'+
B14	1036741/161269	116+42, Rt 20	4.9'	235.7		0-0.3		0.3-2.2'				2.2-36.5'+
B15	1036835/161409	117+10, Lt 135	8.4'	207.8		0-0.2'		0.2-6.0'				6.0-16.8'+
B16	1036854/161335	117+41, Lt 65	9.6'	209.0	0-0.6'			0.6-3.7'				3.7-19.9'+
B17	1036926/161520	117+80, Lt 260	21.2'	208.4		0-0.2'					0.2–1.8'	1.8-30.0'+

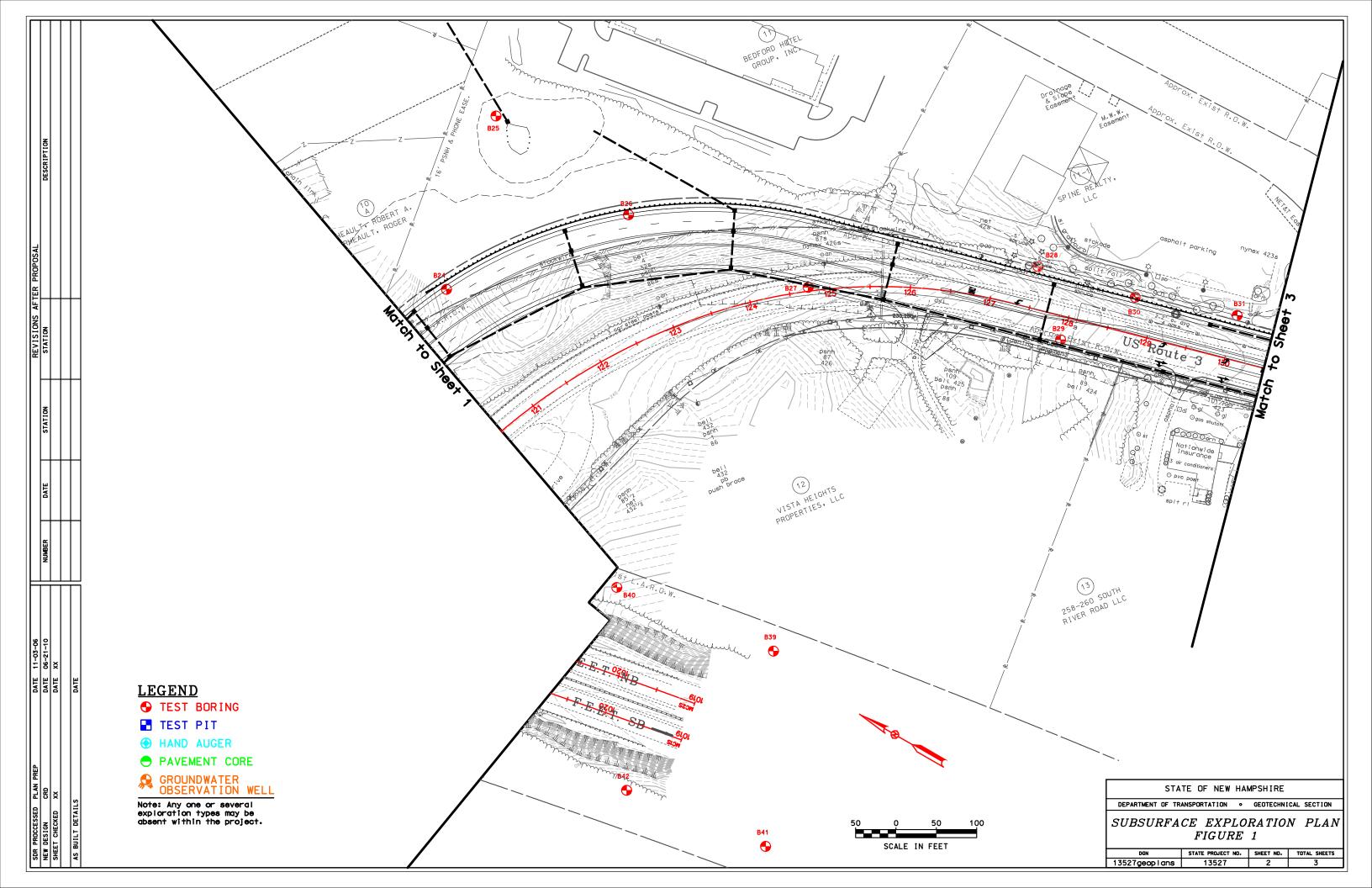
Table 1 Summary of Test Boring Information

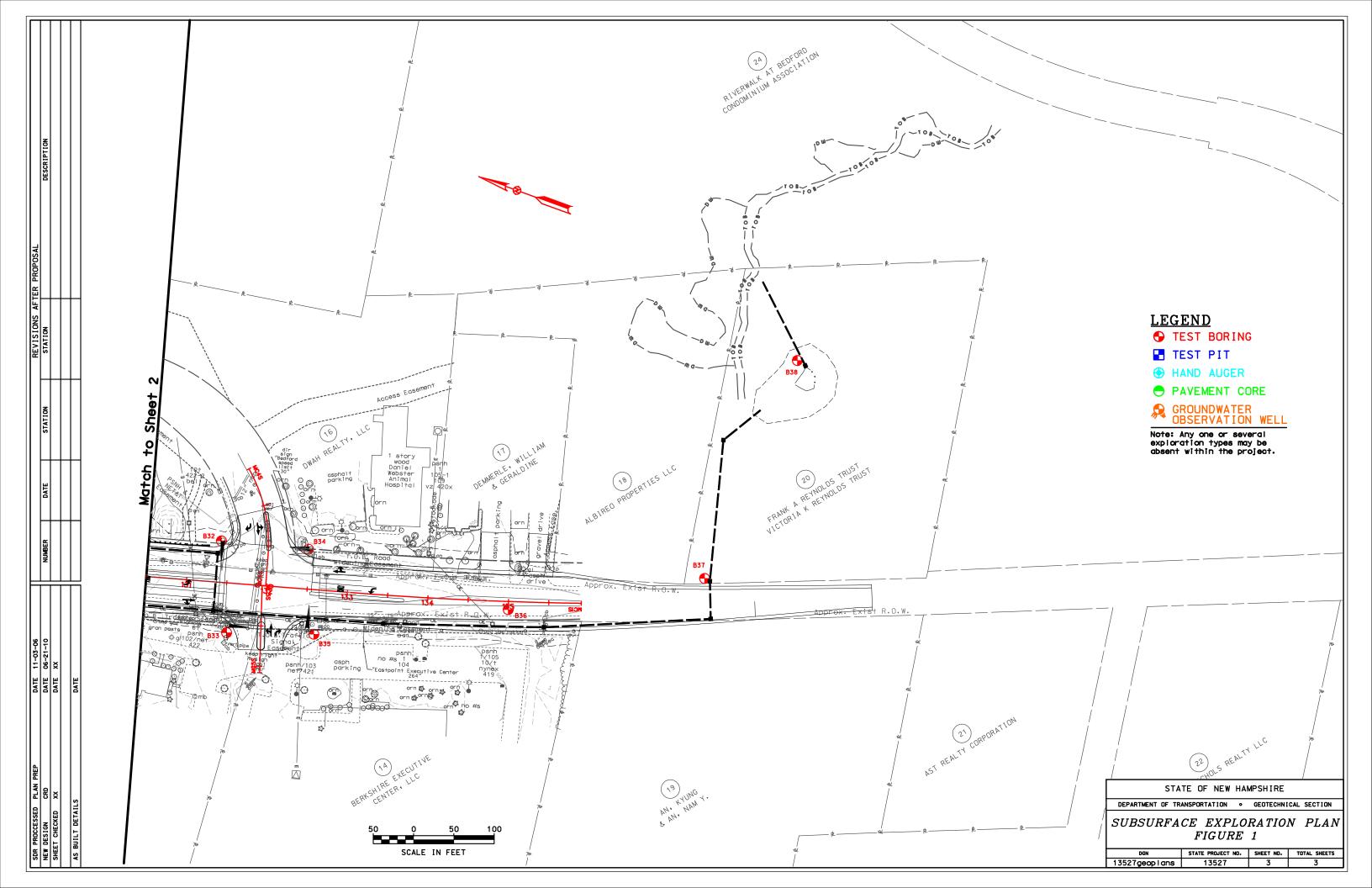
Exploration ID	GPS Coordinates (easting/northing)	Station & Offset	Depth of GW	Elevation of GW	Depth of Asphalt	Depth of Topsoil	Depth of Subsoil	Depth of Fill	Depth of Glacial Fluvial	Depth of Glacial Lacustrine	Depth of Till	Depth of Bedrock
B18	1036949/161419	118+20, Lt 165	18.8'	216.7		0-0.4'	0.4–1.2'				1.2–3.2'	3.2-36.1'+
B19	1036963/161330	118+50, Lt 80	11.5'	227.6		0-0.3'	0.3-2.0'				2.0–3.6'	3.6-35.8'+
B20	1036970/161196	118+81, Rt 51	22.3'	221.5		0-0.3'		0.3-2.0'			2.0-3.0'	3.0-36.0'+
B21	1037030/161420	119+00, Lt 180	Dry	N/A		0-0.4'	0.4-0.9'					0.9-5.7'+
B22	1037046/161228	119+50, Rt 05	8.0'	234.4	0-0.6'			0.6–4.1				4.1-9.4'+
B23	1037078/161321	119+61, Lt 92	Dry	N/A	0-0.2'	3.7-3.9' Buried	3.9-4.2 Buried	0.2-3.7			4.2-6.4'	6.4-12.0'+
B24	1037261/161353	121+00, Lt 180	Dry	N/A		0-0.2'					0.2–1.9'	1.9-11.5'+
B25	1037478/161407	122+25, Lt 330	6.1'	197.3		0-0.3'	0.3-2.0'				2.0-3.5	3.5-13.1'+
B26	1037454/161203	123+00, Lt 150	8.6'	204.0		0-0.2'		0.2–2.0'	2.0-7.5'		7.5– 12.0'+	
B27	1037487/160966	124+74, Lt 05	7.5'	230.4	0-0.8'			0.8-9.0'				9.0-13.8'+
B28	1037652/160732	127+50, Lt 55	Dry	N/A		0-0.7'		0.7–1.7				1.7-6.5'+
B29	1037587/160662	127+97, Rt 29	13.2'	208.3				0-11.3'				11.3- 16.1'+
B30	1037679/160609	128+74, Lt 45	11.6'	198.0		0-0.2'		0.2-1.0'				1.0-12.1'+
B31	1037723/160488	130+00, Lt 55	15.6'	189.9		0-0.3'		0.3–4.7	4.7–19.5'		19.5- 21.3'	21.3- 30.9'+
B32	1037756/160354	131+40, Lt 50	15.9'	190.0		0-0.6'		0.6–4.0'	4.0– 27.0'+			
B33	1037651/160309	131+55, Rt 62	12.5	193.8		0-0.4'		0.4-4.4'	4.4-20.0'+			
B34	1037783/160249	132+50, Lt 50	14.1'	190.5		0-0.6'		0.6–5.0'	5.0–25.4'	25.4 – 27.0'+		

Table 1 Summary of Test Boring Information

Exploration ID	GPS Coordinates (easting/northing)	Station &	Depth of GW	Elevation of GW	Depth of Asphalt	Depth of Topsoil	Depth of Subsoil	Depth of Fill	Depth of Glacial	Depth of Glacial	Depth of Till	Depth of Bedrock
		Offset							Fluvial	Lacustrine		
B35	1037687/160207	132+63,	15.8'	191.6		0-0.4'		0.4-5.0'	5.0-23.0'+			
		Rt 55										
B36	1037798/159991	135+00,	Dry	N/A	0-0.6'			0.6-3.5'	3.5-			
		Rt 10							12.0'+			
B37	1037917/159775		Dry	N/A		0-0.4		0.4-4.3	4.3-12.0'+			
B38	1038210/159760		10.0'	184.7		0-0.6'	0.6-2.5'					2.5-14.6'+
B39	1037075/160778	122+25,	25.9'	243.8		0-0.4'	0.4-1.1'					1.1-70.1'+
		Rt 417										
B40	1037047/160985	120+26,	30.1'	231.4		0-0.2	0.2-1.0'					1.0-63.3'+
		Rt 240										
B41	1036861/160665	118+68,	53.3'	220.6		0-0.4'	0.4-1.0'				1.0-2.6'	2.6-75.1'+
		Rt 593										
B42	1036835/160849	118+10,	23.2'	241.2		0-0.3'	0.3-1.0'				1.0-5.6'	5.5-65.0'+
		Rt 416										







Bedford 13527

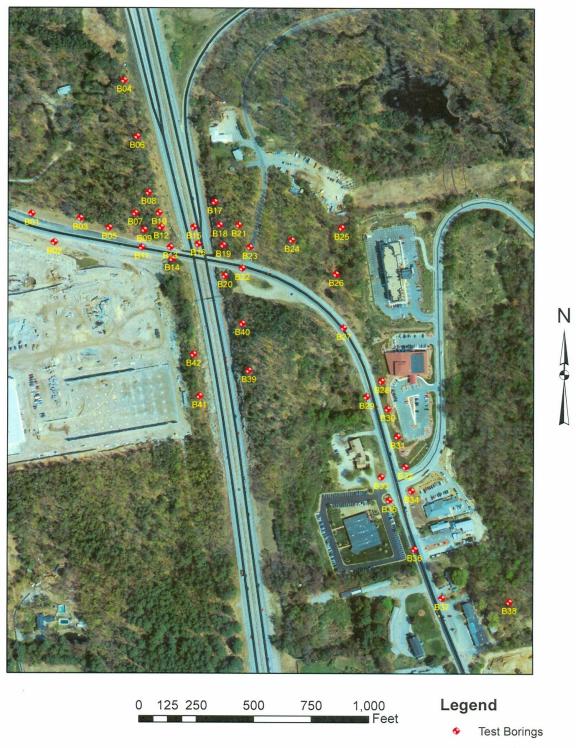


Figure 2

Appendix A

Geotechnical Baseline Report Limitations

GEOTECHNICAL BASELINE REPORT LIMITATIONS

- 1. The baseline geotechnical report was written to summarize and communicate available subsurface information obtained from a variety of sources including: published sources, subsurface explorations conducted in the general area of the project site, laboratory test results on soil samples collected in the subsurface explorations, and existing information in NHDOT records. The report does not include geotechnical design interpretations or recommendations. The report presents subsurface information available at the time of its preparation, and it may be supplemented and/or amended through other prepared documents with information obtained at a later date. The report was prepared prior to finalization of the project design or scope, so it may not reflect or be coordinated with post-preparation changes to the project. The report is not part of the proposal or a contract document, unless stated otherwise.
- 2. All interpretations and conclusions of the project site subsurface conditions made in this report are based upon the data obtained from a limited number of soil samples from widely spaced subsurface explorations. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, whereas actual soil transitions are probably intermixed and more irregular. Variation of subsurface conditions between explorations may and should be expected to occur. The nature and extent of variations between these explorations may not become evident until further subsurface investigation is conducted or during the construction phase. If variations or other latent conditions are revealed by further exploration or during construction, it may be necessary to revise or amend information presented in this report.
- 3. Groundwater level readings were made in the various explorations and/or observation wells at times and under conditions stated on the exploration logs. These data have been reviewed and presented in the report. However, it must be noted that groundwater level measurements obtained in the subsurface explorations may not represent fully stabilized levels, which could have taken a longer period of time to reach equilibrium than was available during the actual completion of the exploration. Also, fluctuations in the groundwater levels may occur due to variations in precipitation amounts, seasonal influences and other factors different from those prevailing at the time measurements were made.
- 4. Except as presented within the report, no other quantitative laboratory testing was performed as part of the site assessment. Where an outside laboratory has conducted such analyses, the NHDOT has not conducted an independent evaluation of the reliability of these data.
- 5. It is the responsibility of the design-builder to determine geotechnical design parameters from the information provided in this report and to determine if any additional information is needed for the interpretation of site subsurface conditions.
- 6. Any questions about the information or presentations made in this report should be referred to the NHDOT Geotechnical Section.

Appendix B

Test Boring Logs (B01 – B42)

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

GROUNDWATER

С

NR

TB-06

Core Barrel

Not Recorded

> 60

16 - 30 31 - 60

Hard

Very Hard



PROJECT NAME **BEDFORD 13527** _ BRIDGE NO.

DESCRIPTION US Route 3 Bridge Replacement **EQUIPMENT** SAMPLER CASING CORE TVDE-9 NI\A/

BORING NO. **B01** SHEET NO. ____1__ OF ___ STA. 109+99 OFF. LT 56 BASELINE US Route 3 ELEVATION (ft) ___ 220.1 START/END <u>8/13/10 / 8/13/10</u> DRILLER J. Pierce (NHDOT)

	DATE	TIME	DEPTH (ft)	ELEV. (ft)	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE: SIZE I.D.	(in):	S 1.375	NW 3	NX 1.875	DRILLER INSPECTOR	J. Pierce Do	e (NHD) oug Rog	
	8/13/10	1:15 pm	3.9	216.2	8.0	12.4		R WT. (lb):	140	DRILI	L RIG	CLASSIFIER		DRR	
	8/13/10	1:45 pm	6.4	213.7	8.0	12.4		R FALL (in):	30		Track rig	EAST/NORTH	(ft) 10	36132/1	61467
	8/16/10	8:00 am	7.5	212.6	None	12.4	HAMMER	R TYPE:	Automatic	OIVIE TO C	, maok ng	LAST/NORTH	(it) <u>io</u>	0010271	1
	DEPTH (ft) — 0 —	STRATUM DEPTH	CHANGE (ft) ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVER' (ft) [%]	Y RANGE (ft)		FIELD) CLASSIF	ICATION	AND REMARK	(S		STRATUM SYMBOL
	O	0.5	219.6	1 5 5	S1	1.1 [55]	2.0	Loose.	rown, loamy] dark yellowis gravel to "grav	h brown to	/ellowish bro It, little-trace -FILL-	own, MEDIUM-FINe coarse sand	NE SAND	·	
		2.0	218.1	9 13 20 19	S2	1.2 [60]	2.0	MEDIL		ID, some-litt	k yellowish t le silt, little g	orown to greyish b gravel, little coarse nt			
	- 5 -			16 27 26 30	S3	1.3 [65]	4.0	little-tra	ace coarse sa	nd, trace me -C	edium sand GLACIAL TIL			_	
		6.5	213.6	28 78	S4	0.6 [60]	6.0	Simila	to S3; very s	everely wea	thered rock	in end of spoon tip	ρ		
				76			8.1	Advan	-Alced hole to 8.			CK SURFÄCE-			
	— 10 —				C1	4.8 [100]		sound, Foliation	gréy and blac	ck, coarse-g fined, not di	rained, GNE	to fresh, slightly fr EISS. Small seam r most of the run.			
							12.9								
									Bott	om of Explo	ration @ 12	2.9 ft (El. 207.2)			
	— 15 —														
9/20/2010 2:21:46 PM TB-06	- 20 -														
S:\GINTW/PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/201	- 25 -														
OJECTS\BEI	S		d Split Spo		Blows		Consisten	cy !	Blows/foot	ESIVE SOILS Density	C	oil Descriptions apitalized Soil Nam	e Maj	portion or Compo	onent
\PR(SL T	Large Sp Thin Wa	ooon (O.D. all Tube	= 3 in)	0 - 2 -		Very Soft Soft		0 - 4 5 - 10	Very Loose Loose		ower Case Adjective ome		6 - 50% 6 - 35%	
Ě	U	Undistur	bed Piston	l	5 -	8	Medium S		11 - 24	Medium De	_	ttle	10%	6 - 20%	
9	0	Open Er			9 -		Stiff		25 - 50	Dense	I	race	1%	6 - 10%	
8 9	A C	Auger Fl			16 -		Very Stiff		> 50 VOR - Weight	Very Dense	=		01.101.1		

WOR - Weight of Rod

WOH - Weight of Hammer

ENGLISH

New Hampshire

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

US Route 3 Bridge Replacement

31

> 60

Very Hard

Hard

С

NR

TB-06

Core Barrel

Not Recorded

PROJECT NAME **BEDFORD 13527**

DESCRIPTION

N/A BRIDGE NO.

GROUNDWATER EQUIPMENT SAMPLER **CASING CORE** BOTTOM BOTTOM OF CASING OF HOLE TYPE NW NX DEPTH (ft) ELEV. DATE TIME SIZE I.D. (in): 1.375 1.875 (ft) (ft) 3

BORING NO. **B02** SHEET NO. ___1__ OF _ STA. 111+28 OFF. RT 39 US Route 3 BASELINE _ ELEVATION (ft) _ 229.7 START/END <u>8/17/10 / 8/17/10</u> DRILLER J. Pierce (NHDOT) INSPECTOR Doug Rogers

_	2/1-		(ft)	· · ·	OF CASING			SIZE I.D.		1.375	3	1.875	INSPECTOR _	Doug Rog	
-	8/17/10	10:10 am	5.4	224.3	8.7	13.5	_		R WT. (lb): R FALL (in):	140 30	<u>DRIL</u>	<u>L RIG</u>	CLASSIFIER _	DRR	
- }	8/17/10	10:30 am	5.6	224.1	8.7	13.5		HAMMER		Automatic	CME 45-0	C Track rig	EAST/NORTH (ft)	1036229/1	61341
	DEPTH (ft)		CHANGE (ft)	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLEF RECOVER (ft) [%]	3	DEPTH RANGE (ft)			CLASSIF	FICATION	AND REMARKS		STRATUM SYMBOL
ŀ	- 0 -	0.3	229.4	3		(1.7[70]	0	.0	Dark h	rown, loamy	TOPSOII				
		0.5	225.4	6 8	S1	1.2 [60]		2.0	Mediui some		greyish bro	own and dar se-medium	- — — — — — — — K k yellowish brown, Fli sand	————— NE SAND,	
				6 6 6	S2	0.9 [45]		.0	Mediu	m dense, grey SAND, little gr	vish brown-y avel, little co	ellowish bro parse-mediu	own and dark greyish im sand, little silt	brown,	
				4	1			4.0				-FILL-			
	- 5 -			3 3 2	S3	0.5 [25]		.0	silt to "		avel, little co		vn, MEDIUM-FINE Solated pocket of very		
				3 2	S4	0.3 [15]		.0		•		ARSE-FINE	SAND, trace silt		
				2				0.0		ose, greyisir i	JIOWII, COP	NIXOL-I IINL	SAND, trace sit		\bowtie
				3	S5	0.2 [29]	8	.0	a	to S4, some	silt trace o	ravel			
		8.7	221.0	7/0.2		1		.7 .7	Jiiiilai				CK SURFACE-		
										-^	i i i i i i i i i i i i i i i i i i i		ON OUN AUL-		
	- 10 -				C1	4.8 [100]	,						derately to slightly frac eous at 10.9'. Joints a		
									close t end of	o closely spac	ced. Noted s		r loss while coring at		
								40.5		2.974.0 - 00	70				
								13.5		Pott	tom of Evole	eration @ 1	2 F ft /Fl 216 2)		<i>Y///</i>
										DOLL	torii oi Expid	oration @ 1	3.5 ft (El. 216.2)		
-	– 15 –														
TB-06															
Md 8															
2:21:48 PM	- 20 -														
010															
3/20/2															
GPJ 9															
NGS.															
BORI															
UTE3	- 25 -														
27/RO															
1352															
ORD															
S:\GINTW\PROJECTS\BEDFORD\13627\ROUTE3BORINGS.GPJ 9/20/2010															
:CTS/		Identifica			1	COHESIN					ESIVE SOILS	_	oil Descriptions	Proportion	1
3OJE	S SL		d Split Spo		Blows/	<u>foot</u> 1		onsister ery Soft	icy l	Blows/foot 0 - 4	Density Very Loose		apitalized Soil Name ower Case Adjective	Major Compo	
MPF	Т	Thin Wa	ıll Tube	•	2 -	4	Sc	oft		5 - 10	Loose	s	ome	20% - 35%	
TN	U O	Undistur	bed Piston	1	5 - 9 -	8 15	Me Sti	edium S		11 - 24 25 - 50	Medium Dense		ittle race	10% - 20% 1% - 10%	
	Α	Auger FI	ight		16 -	30	Ve	ry Stiff		> 50	Very Dens	I .			
9	C	Core Bar	rrol		1 31 -	60	ш	ard	1 \	VOR - Weight	of Dod		ENO		

WOR - Weight of Rod

WOH - Weight of Hammer

ENGLISH

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

16 - 30 31 - 60

> 60

Very Stiff

Very Hard

Hard

> 50

WOR - Weight of Rod

WOH - Weight of Hammer

Very Dense

ENGLISH

Auger Flight

Core Barrel

Not Recorded

TB-06

С

NR

DESCRIPTION US Route 3 Bridge Replacement

GROUNDWATER



PROJECT NAME <u>BEDFORD 13527</u> BRIDGE NO. <u>N/A</u>

EQUIPMENT

| SAMPLER CASING CORE | S NW NX | 1.375 | 3 | 1.875

BORING NO. B03

SHEET NO. __1 OF __1
STA. __112+17 OFF. __LT 90

BASELINE ____ US Route 3

ELEVATION (ft) ____ 224.7

START/END ____ 8/13/10 / 8/13/10

DRILLER ___ J. Pierce (NHDOT)

INSPECTOR ____ Doug Rogers

CLASSIFIER ____ DRR

EAST/NORTH (ft) ____ 1036341/161448

DATE	TIME	DEPTH	ELEV.	воттом	воттом	TYPE:		S	NW	NX	DRILLER _		ce (NHD	
DATE	TIME	(ft)	(ft)	OF CASING	OF HOLE	SIZE I.D.	. ,	1.375	3	1.875	INSPECTOR	<u>D</u>	oug Rog	
8/13/10	10:30 am	-	222.9	5.3	5.3	HAMMER		140	DRIL	<u>L RIG</u>	CLASSIFIER		DRR	
8/13/10	2:00 pm	1.9	222.8	None	5.3	HAMMER	FALL (in):	30 Automatic	CME 45-0	C Track rig			036341/1	161448
	OTDATUM.	CHANCE (#)	BLOWS	<u> </u>	CAMPLED	_	IIIFL.	Automatic				(-/		1
DEPTH (ft)		CHANGE (ft)	PFR	SAMPLE NUMBER	SAMPLER RECOVERY	RANGE		FIELD	CLASSIF	CATION	AND REMARK	(S		STRATU
- (ii) -	DEPTH	ELEVATION			(11) [%]	(ft)								OTIVIDO
	0.5	224.2	WOH	S1	0.3 [60]	0.0 0.5	Black-	very dark grey	ish brown, f	ibrous TOP	SOIL, little muck			
			5/0			0.5		-A	PPROXIMA	TE BEDRO	OCK SURFACE-			
							Hard, v	ery slightly w	eathered to	fresh, sligh	tly fractured to so	und, grey	and	
				C1	4.8 [100]						ally intruded w/ th			
				0.	1.0 [100]		coarse	-grained GRA	ANITE. Joint	s are shallo	w dipping w/ exce	ption of h	nigh	
							Annrox	imately 0.5' o	f core left in	s silaliow lo hole	moderate, where	uisceriii	DIE.	
								4.3 / 4.8 = 90						
- 5 -						5.3							_	
								Bot	ttom of Expl	oration @ !	5.3 ft (El. 219.4)			
								20.			2.0,			
40														
– 10 –														
- 15 -	_													
00														
- 20 -														
25 –				1										
_0														
				1										
	Identifica				COHESIVI		_ _		ESIVE SOILS		Soil Descriptions		oportion	
S SL		d Split Spo		Blows		Consisten	CY E	Blows/foot	Density Very Lease		Capitalized Soil Nan		ajor Comp 5% - 50%	
SL T	Thin Wa	ooon (O.D. all Tube	- sm)	0 - 2 -		Very Soft Soft		0 - 4 5 - 10	Very Loose Loose		.ower Case Adjectiv Some		0% - 50% 0% - 35%	
ΰ		bed Piston	1	5 -		Medium S	tiff /	11 - 24	Medium De		ittle)% - 30%)% - 20%	
0	Open Er	nd Rod		9 -	15	Stiff	2	25 - 50	Dense	т	race		% - 10%	
Sampler S SL T U O A	Auger F	liaht		16 -	30	Very Stiff	1 :	> 50	Very Dense	<u> </u>				

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

31

> 60

-

60

Very Hard

Hard

Core Barrel

Not Recorded

С

NR

TB-06

New Hampshire

PROJECT NAME **BEDFORD 13527** N/A BRIDGE NO. US Route 3 Bridge Replacement DESCRIPTION

GROUNDWATER EQUIPMENT SAMPLER **CASING CORE** TYPE: NW NX BOTTOM BOTTOM OF CASING OF HOLE DEPTH ELEV. DATE TIME SIZE I.D. (in): 1.375 1.875 (ft) (ft) 3 HAMMED WT (Ib)

BORING NO. **B04** SHEET NO. ___1__ OF _ STA. <u>113+10</u> OFF. <u>LT 720</u> US Route 3 BASELINE _ ELEVATION (ft) __ 174.4 START/END _____8/9/10 / 8/9/10 DRILLER J. Pierce (NHDOT) Doug Rogers INSPECTOR ___

ENGLISH

8/9/10	10:45 am	Dry		5.8	5.3	HAMMER		140	DRILL RIG		CLASSIFIER	DRR	
8/9/10	11:00 am	Dry		None	5.3	HAMMER	R FALL (in):	30 Automatic	CME 45-C Trac	k rig	EAST/NORTH (ft)	1036530/1	
DED=::	STRATUM	CHANGE (ft)	BLOWS	04447	SAMPLER								
DEPTH (ft)	DEPTH	ELEVATION	PER	SAMPLE NUMBER	RECOVERY (ft) [%]			FIELD	CLASSIFICAT	ION .	AND REMARKS		STRA [*] SYME
- 0 —	0.3	174.1	WOH	S1	0.6 [60]	0.0		rown, fibrous					S.J.
	1.0	173.4	1 10/0			1.0	_ Dark y √few fib		n to yellowish brov -SUBSOIL-	vn, FII	NE SAND, some silt to	o "silty",	V///
			10/0				/iew iib	-A	PPROXIMATE BE	DRO	CK SURFACE-		
							Hard. f	resh to verv s	slightly weathered.	sound	I to moderately fractur	ed. arev	
				C1	4.3 [90]		and bla	ack, coarse-m	nedium grained, Gl	NEISS	. Foliation is moderate	e, where	
							discerr	nible. Approxii 4.3 / 4.8 = 90	mately 0.5' of core	left in	hole, unable to retriev	e.	
5 —							NQD.	+.5 / 4.0 - 50	70			-	\mathbb{K}
						5.8							\mathbb{Z}
								Bo	ttom of Exploration	@ 5	.8 ft (El. 168.6)		
10													
10 —													
15 —													
20 —													
0-													
25 —													
	Identifica				COHESIVE				ESIVE SOILS		oil Descriptions	Proportion	
S SL		d Split Spo		Blows/		Consisten Very Soft	cy E	Blows/foot 0 - 4	<u>Density</u> Very Loose		apitalized Soil Name ower Case Adjective	Major Comp 35% - 50%	
Т	Thin Wa		– J III)	2 -	4	Soft		5 - 10	Loose		ome	20% - 35%	
U		bed Piston	l	5 -		Medium S		11 - 24	Medium Dense		tle	10% - 20%	
O A	Open Er Auger Fl			9 -		Stiff Very Stiff		25 - 50 > 50	Dense Very Dense	ır	ace	1% - 10%	
Ĉ	Core Ba			31 -		very ou⊓ ⊣ard		VOR - Weight			ENO.		

WOR - Weight of Rod

WOH - Weight of Hammer

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

16 - 30 31 - 60

> 60

Very Stiff

Very Hard

Hard

> 50

WOR - Weight of Rod

WOH - Weight of Hammer

Very Dense

ENGLISH

Auger Flight

Not Recorded

Core Barrel

TB-06

С

NR

DESCRIPTION US Route 3 Bridge Replacement

GROUNDWATER



MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME **BEDFORD 13527** _ BRIDGE NO.

EQUIPMENT

SAMPLER CASING CORE S NW

BORING NO. **B05** SHEET NO. ___1__ OF ___1 STA. <u>113+50</u> OFF. <u>LT 70</u> BASELINE US Route 3 234.3 ELEVATION (ft) ____ START/END <u>8/13/10 / 8/13/10</u> DRILLER J. Pierce (NHDOT)

March Marc			GROUNL	JWAIE	K		EQUIP	IVIEINI	SAMPLER	CASING	CORE	• · · · · · · · · · · · · · · · · · · ·		
10 15 15 15 15 15 15 15	DATE	TIME	DEPTH		воттом	воттом			S					
13910 945 mm 49 2244 6.5 6.5 140	DAIL	TIIVIL	(ft)	(ft)	OF CASING	OF HOLE		. ,		3	1.875	INSPECTOR _	Doug Ro	gers
Part	8/13/10	9:30 am	4.9	229.4	6.5	6.5				DRILI	L RIG	CLASSIFIER	DRR	
Port	8/13/10	9:45 am	4.9	229.4	6.5	6.5				CME 45-0	Track rig			
0					<u> </u>		HAMMEF	R TYPE:	Automatic	OIVIL 40 C	7 Track rig	EAST/NORTH (II)	1000-1011	10170
1.5	DEPTH .		· · · · · ·	BLOWS	SAMPLE	SAMPLER	DEPTH		FIEI C	O CLASSIE	ICATION	AND REMARKS		STRA
1.5 232.8 1 1 2 232.8 2 4:0		DEPTH	ELEVATION	0.5 ft	NOMBER	(ft) [%]	(ft)			02,100	10, 111011	, ID I (LIV) (1 (C		SYME
1	0 —	0.3	234.1	1			0.0	⊃ Dark b	rown. fibrous	TOPSOIL				≈:>
1.5			_	1	S1	0.8 [53]		Verv lo	ose. dark vell	lowish brown	and vellow	ish brown. FINE SAN	ND. some	~~
S Standard Spill Spoon (S.D. 3 in) 5 COHESNE SOILS NON-COHESNE SOILS Standard Spill Spoon (S.D. 1 in 1982) 5 - 1 15 - 25 - 25 - 25 - 25 - 25 - 25		1 =	222.0	2			1.5						,	\sim
Hard, very slightly weathered, sound, grey-pinkish grey and black, coarse-grained, GNEISSIC GRANITE. Two distinct zones of extreme fracturing, one from 2.7-2.8° and the other from 5-5.1°. Joints are shallow dipping. RQD: 4.7 / 5.0 = 94% Bottom of Exploration @ 6.5 ft (EI. 227.8) COHESIVE SOILS Signal and Spill Spoon Signal Spill Spoon Spill Spill Spoon Signal Spill Spoon Spill Spill Spoon Spill Spill Spoon Spill Spill Spoon Spill Spill Spill Spoon Spill		1.5	232.0	4/	0		1.5		-Δ	PPROXIMA	TE BEDRO	CK SURFACE-		
C1 5.0 100									,,		TE BEBITO	or coru rice		
C1 5.0 100														
C1 5.0 100								Hard. v	verv sliahtlv w	eathered, so	ound, arev-p	inkish grev and black	ζ.	
10 -					C1	5.0 [100]		coarse	grained, GNI	EISSIC GRA	ANITÉ. Two	distinct zones of extr	éme	
RÖD: 4.7 / 5.0 = 94% 8.5 Bottom of Exploration @ 6.5 ft (El. 227.8) 10 − 15 − 20 − 25 − 25 − 25 − 26 − 27 − 28 Slandard Split Spoon Sl. Large Spoon (o.D.= 5 int) 0 − 1 Very Soft 0 − 4 Very Loose Capitalized Soin Name Major Component Sl. Large Spoon (o.D.= 5 int) 0 − 1 Very Soft 0 − 4 Very Loose Capitalized Soin Name Major Component Sl. Large Spoon (o.D.= 5 int) 0 − 1 Very Soft 0 − 4 Very Loose Capitalized Soin Name Major Component Sl. Large Spoon (o.D.= 5 int) 0 − 1 Very Soft 0 − 4 Very Loose Capitalized Soin Name Major Component Sl. Large Spoon (o.D.= 5 int) 0 − 1 Very Soft 0 − 4 Very Loose Some So														
10 -	5 —	-											_	#//
Bottom of Exploration @ 6.5 ft (El. 227.8)								RQD:	4.7 / 5.0 = 94	%				
Bottom of Exploration @ 6.5 ft (El. 227.8)														$\rangle\rangle\rangle$
20 — 25 — 26 — 27 — 28 Slandard Split Spoon SL Large Spoon (O.D.= 3 in) SL Large Spoon (O.D.= 3 in) SL Large Spoon (O.D.= 3 in) T Thin Wall Tube 2 - 4 Soft 0 - 4 Very Loose Some Some Specialized Soil Name Lower Case Adjective 35% - 55% 26 - 55 - 10 Loose Some Some Some Specialized Soil Name Lower Case Adjective 35% - 55% - 35%							6.5							Y ///
20 -									Bot	ttom of Explo	oration @ 6	.5 ft (El. 227.8)		
20 -														
20 -														
20 -														
20 -														
20 -	10													
25 — 25 — 26 — 27 — 28 — 28 — 28 — 28 — 29 — 20 — 20 — 20 — 20 — 20 — 20 — 20 — 21 — 22 — 23 — 24 — 25 — 26 — 27 — 28 — 28 — 28 — 29 — 20 —	10 –]												
25 — 25 — 26 — 27 — 28 — 28 — 28 — 28 — 29 — 20 — 20 — 20 — 20 — 20 — 20 — 20 — 21 — 22 — 23 — 24 — 25 — 26 — 27 — 28 — 28 — 28 — 29 — 20 —														
25 — 25 — 26 — 27 — 28 — 28 — 28 — 28 — 29 — 20 — 20 — 20 — 20 — 20 — 20 — 20 — 21 — 22 — 23 — 24 — 25 — 26 — 27 — 28 — 28 — 28 — 29 — 20 —														
25 — 25 — 26 — 27 — 28 — 28 — 28 — 28 — 29 — 20 — 20 — 20 — 20 — 20 — 20 — 20 — 21 — 22 — 23 — 24 — 25 — 26 — 27 — 28 — 28 — 28 — 29 — 20 —														
25 — 25 — 26 — 27 — 28 — 28 — 28 — 28 — 29 — 20 — 20 — 20 — 20 — 20 — 20 — 20 — 21 — 22 — 23 — 24 — 25 — 26 — 27 — 28 — 28 — 28 — 29 — 20 —														
25 — 25 — 26 — 27 — 28 — 28 — 28 — 28 — 29 — 20 — 20 — 20 — 20 — 20 — 20 — 20 — 21 — 22 — 23 — 24 — 25 — 26 — 27 — 28 — 28 — 28 — 29 — 20 —														
25 — 25 — 26 — 27 — 28 — 28 — 28 — 28 — 29 — 20 — 20 — 20 — 20 — 20 — 20 — 20 — 21 — 22 — 23 — 24 — 25 — 26 — 27 — 28 — 28 — 28 — 29 — 20 —														
25 — 25 — 26 — 27 — 28 — 28 — 28 — 28 — 29 — 20 — 20 — 20 — 20 — 20 — 20 — 20 — 21 — 22 — 23 — 24 — 25 — 26 — 27 — 28 — 28 — 28 — 29 — 20 —														
25 — 25 — 26 — 27 — 28 — Lengt Spoon (O.D.= 3 in) 28 — Thin Wall Tube 29 — Very Soft 20 — Very Loose 20 — 35% 20 — Very Soft 20 — Very Loose 20 — 35% 20 — 35%														
25	15 -	+												
25														
25														
25														
ampler Identification S Standard Split Spoon SL Large Spoon (O.D.= 3 in) T Thin Wall Tube COHESIVE SOILS Blows/foot Consistency O - 1 Very Soft O - 4 Very Loose Some Some Soil Descriptions Proportion Major Component O - 4 Very Loose Some Some 20% - 35%														
ampler Identification S Standard Split Spoon SL Large Spoon (O.D.= 3 in) T Thin Wall Tube COHESIVE SOILS Blows/foot Consistency O - 1 Very Soft O - 4 Very Loose Some Some Soil Descriptions Proportion Major Component O - 4 Very Loose Some Some 20% - 35%														
ampler Identification S Standard Split Spoon SL Large Spoon (O.D.= 3 in) T Thin Wall Tube COHESIVE SOILS Blows/foot Consistency O - 1 Very Soft O - 4 Very Loose Some Some Soil Descriptions Proportion Major Component O - 4 Very Loose Some Some 20% - 35%														
ampler Identification S Standard Split Spoon SL Large Spoon (O.D.= 3 in) T Thin Wall Tube COHESIVE SOILS Blows/foot Consistency O - 1 Very Soft O - 4 Very Loose Some Some Soil Descriptions Proportion Major Component O - 4 Very Loose Some Some 20% - 35%														
25														
25	20 _													
ampler Identification S Standard Split Spoon SL Large Spoon (O.D.= 3 in) T Thin Wall Tube COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS Blows/foot Density 0 - 4 Very Loose 0 - 4 Very Loose 1 Some 2 - 4 Soft 5 - 10 Loose 3 Some 2 0% - 35%	20 —													
ampler Identification S Standard Split Spoon SL Large Spoon (O.D.= 3 in) T Thin Wall Tube COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS Blows/foot Density 0 - 4 Very Loose 0 - 5 - 10 Loose 0 - 35%														
ampler Identification S Standard Split Spoon SL Large Spoon (O.D.= 3 in) T Thin Wall Tube COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS Blows/foot Density 0 - 4 Very Loose 0 - 4 Very Loose 1 Some 2 - 4 Soft 5 - 10 Loose 3 Some 2 0% - 35%														
ampler Identification S Standard Split Spoon SL Large Spoon (O.D.= 3 in) T Thin Wall Tube COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS Soil Descriptions Capitalized Soil Name Major Component Lower Case Adjective 35% - 50% Some 20% - 35%														
ampler Identification S Standard Split Spoon SL Large Spoon (O.D.= 3 in) T Thin Wall Tube COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS Soil Descriptions Capitalized Soil Name Major Component Lower Case Adjective 35% - 50% Some 20% - 35%														
ampler Identification S Standard Split Spoon SL Large Spoon (O.D.= 3 in) T Thin Wall Tube COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS NON-COHESIVE SOILS Soil Descriptions Capitalized Soil Name Major Component Lower Case Adjective 35% - 50% Some 20% - 35%														
ampler Identification COHESIVE SOILS NON-COHESIVE SOILS Soil Descriptions Proportion S Standard Split Spoon Blows/foot Consistency Blows/foot Capitalized Soil Name Major Component SL Large Spoon (O.D.= 3 in) 0 - 1 Very Soft 0 - 4 Very Loose Lower Case Adjective 35% - 50% T Thin Wall Tube 2 - 4 Soft 5 - 10 Loose Some 20% - 35%														
ampler Identification COHESIVE SOILS NON-COHESIVE SOILS Soil Descriptions Proportion S Standard Split Spoon Blows/foot Consistency Blows/foot Capitalized Soil Name Major Component SL Large Spoon (O.D.= 3 in) 0 - 1 Very Soft 0 - 4 Very Loose Lower Case Adjective 35% - 50% T Thin Wall Tube 2 - 4 Soft 5 - 10 Loose Some 20% - 35%														
ampler Identification COHESIVE SOILS NON-COHESIVE SOILS Soil Descriptions Proportion S Standard Split Spoon Blows/foot Consistency Blows/foot Density Capitalized Soil Name Major Component SL Large Spoon (O.D.= 3 in) 0 - 1 Very Soft 0 - 4 Very Loose Lower Case Adjective 35% - 50% T Thin Wall Tube 2 - 4 Soft 5 - 10 Loose Some 20% - 35%														
ampler Identification COHESIVE SOILS NON-COHESIVE SOILS Soil Descriptions Proportion S Standard Split Spoon Blows/foot Consistency Blows/foot Density Capitalized Soil Name Major Component SL Large Spoon (O.D.= 3 in) 0 - 1 Very Soft 0 - 4 Very Loose Lower Case Adjective 35% - 50% T Thin Wall Tube 2 - 4 Soft 5 - 10 Loose Some 20% - 35%	25 —	4												
S Standard Split Spoon Blows/foot Consistency Blows/foot Density Capitalized Soil Name Major Component SL Large Spoon (O.D.= 3 in) 0 - 1 Very Soft 0 - 4 Very Loose Lower Case Adjective 35% - 50% T Thin Wall Tube 2 - 4 Soft 5 - 10 Loose Some 20% - 35%	-													1
S Standard Split Spoon Blows/foot Consistency Blows/foot Density Capitalized Soil Name Major Component SL Large Spoon (O.D.= 3 in) 0 - 1 Very Soft 0 - 4 Very Loose Lower Case Adjective 35% - 50% T Thin Wall Tube 2 - 4 Soft 5 - 10 Loose Some 20% - 35%														
S Standard Split Spoon Blows/foot Consistency Blows/foot Density Capitalized Soil Name Major Component SL Large Spoon (O.D.= 3 in) 0 - 1 Very Soft 0 - 4 Very Loose Lower Case Adjective 35% - 50% T Thin Wall Tube 2 - 4 Soft 5 - 10 Loose Some 20% - 35%														
S Standard Split Spoon Blows/foot Consistency Blows/foot Density Capitalized Soil Name Major Component SL Large Spoon (O.D.= 3 in) 0 - 1 Very Soft 0 - 4 Very Loose Lower Case Adjective 35% - 50% T Thin Wall Tube 2 - 4 Soft 5 - 10 Loose Some 20% - 35%														1
S Standard Split Spoon Blows/foot Consistency Blows/foot Density Capitalized Soil Name Major Component SL Large Spoon (O.D.= 3 in) 0 - 1 Very Soft 0 - 4 Very Loose Lower Case Adjective 35% - 50% T Thin Wall Tube 2 - 4 Soft 5 - 10 Loose Some 20% - 35%														
S Standard Split Spoon Blows/foot Consistency Blows/foot Density Capitalized Soil Name Major Component SL Large Spoon (O.D.= 3 in) 0 - 1 Very Soft 0 - 4 Very Loose Lower Case Adjective 35% - 50% T Thin Wall Tube 2 - 4 Soft 5 - 10 Loose Some 20% - 35%														
S Standard Split Spoon Blows/foot Consistency Blows/foot Density Capitalized Soil Name Major Component SL Large Spoon (O.D.= 3 in) 0 - 1 Very Soft 0 - 4 Very Loose Lower Case Adjective 35% - 50% T Thin Wall Tube 2 - 4 Soft 5 - 10 Loose Some 20% - 35%														
S Standard Split Spoon Blows/foot Consistency Blows/foot Density Capitalized Soil Name Major Component SL Large Spoon (O.D.= 3 in) 0 - 1 Very Soft 0 - 4 Very Loose Lower Case Adjective 35% - 50% T Thin Wall Tube 2 - 4 Soft 5 - 10 Loose Some 20% - 35%	ampler	Identific	ation			COHESIV	F SOILS		NON-COH	FSIVE SOILS	; c,	nil Descriptions	Proportion	
SL Large Spoon (O.D.= 3 in) 0 - 1 Very Soft 0 - 4 Very Loose Lower Case Adjective 35% - 50% T Thin Wall Tube 2 - 4 Soft 5 - 10 Loose Some 20% - 35%				on	Blowe			cv l						Onent
T Thin Wall Tube 2 - 4 Soft 5 - 10 Loose Some 20% - 35%								~ '			. La	ower Case Adjective		
				,					-					
U Undisturbed Piston 5 - 8 Medium Stiff 11 - 24 Medium Dense Little 10% - 20%	U	Undistur	bed Piston	I	5 -	8	Medium S	tiff /	11 - 24	Medium De	ense Lit	ttle	10% - 20%)
O Open End Rod 9 - 15 Stiff 25 - 50 Dense Trace 1% - 10%	\circ	Open Fr	nd Rod		9 -	15	Stiff		25 - 50	Dense	Tr	ace	1% - 10%	,

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

31

> 60

Very Hard

Hard

NR

TB-06

Core Barrel

Not Recorded



PROJECT NAME **BEDFORD 13527** N/A BRIDGE NO. DESCRIPTION US Route 3 Bridge Replacement

GROUNDWATER **EQUIPMENT** SAMPLER **CASING CORE** DATE TIME DEPTH ELEV. BOTTOM BOTTOM TYPE: NW

BORING NO. **B06** SHEET NO. ___1__ OF _ STA. <u>114+05</u> OFF. <u>LT 485</u> BASELINE US Route 3 ELEVATION (ft) ___ 200.4 START/END 8/9/10 / 8/9/10 DRILLER J. Pierce (NHDOT)

	DATE	TIME	DEPTH (ft)		BOTTOM OF CASING	OF HOLE	SIZE I.D.	(in):	1.375	3		INSPECTOR _	Doug Ro	ners
	8/9/10	1:45 pm	7.6	192.8	8.0	12.0		R WT. (lb):	140	DRILI	RIG		DRR	
	8/9/10	2:00 pm	8.1	192.3	8.0	12.0		R FALL (in):	30			CLASSIFIER _		
	8/10/10	8:00 am	Dry		None	10.9	HAMMER		Automatic	CME 45-C	, irack rig	EAST/NORTH (ft)	1036588/	161809
	DEPTH	STRATUM	CHANGE (ft)	BLOWS	SAMPLE	SAMPLER	DEPTH							STRATUM
	(ft)	DEPTH	ELEVATION	PER 0.5 ft	NUMBER	RECOVERY (ft) [%]	RANGE		FIELD	CLASSIF	CATION	AND REMARKS		SYMBOL
	- 0 -					(11) [70]	(ft) 0.0							1
		0.2	200.2	1			0.0	Dark b	rown, fibrous	TOPSOIL		EINE OANE		$\sim \sim$
				2 2	S1	0.5 [25]				owish brown	n to yellowisi	h brown, FINE SAND), some silt,	~~~
				3				few fib	ers		-SUBSOIL-			 ~~~~
		2.0	198.4	6	` 		2.0				-SUBSUIL-	•		KINE N
				8				Donco	light olive ar	ovieh brown	EINE SANI	D, some silt to "silty",	little gravel	A A
				14	S2	0.6 [30]						ely weathered rock fr		
				16			4.0	intuo oc	arse mealam	Jana, Jooda	sional seven	cry weathered rook in	agmont	10 4 3
				22			4.0	l . <i>.</i> .				.===		4
	- 5 -			27	S3	1.2 [60]						IEDIUM-FINE SAND rely weathered rock t		
				39		[00]		throug		lie Coalse sa	and, w/ seve	rely weathered rock	iraginents	
				37	-		6.0	unoug	ilout					11/
				31			0.0	l						14-3
				42	S4	1.3 [65]		Very d	ense, brownis			UM-FINE SAND, sim	nilar to S3	144
				52						-(-	BLACIAL TIL	_L-		Y IA
				74/0.3	S5	0.2 [67]	8.0 8.0 8.3	Grev s	similar to S4					
									ced hole throu	igh cobble (8 3'_8 6'\ 141	roller hit		ΔΔ
								Auvario	sed HOIE HIIOL	igi i cobbie (d	J.J-U.U) W/	IOHEI DIL		100
	_ 10 _												_	
	10 =			32			10.0						_	
				76	S6	1.3 [65]		Very d	ense, grey-oli	ve grey, ME	DIUM-FINE	SAND, little gravel, li	ittle coarse	AX.
				58		[]		sand, \	w/ severely an	d very sever	rely weather	ed rock fragments		
				66	-		12.0							
									Bott	om of Explo	ration @ 12	2.0 ft (El. 188.4)		
	45													
	− 15 −	1												
TB-06														
Щ														
2:21:54 PM														
54														
2	− 20 −													
0														
2010														
9/20/2														
6														
GP,														
3S.(
ĭ⊠														
30F														
E3E	– 25 –													
Ž	-													
'RC														
527														
113														
JRC														
JFC														
BEL														
S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ	Sampler	Identifica	ation	1		COHESIVI	E SOILS		NON-COH	ESIVE SOILS	<u> </u>	oil Descriptions	Proportion	1
JEC	Sample		d Split Spo	on	Blows		Consisten	cv F	Blows/foot	Density	1 -	apitalized Soil Name	Major Comp	onent
RÔ	SL		poon (O.D.		0 -		Very Soft	- '	0 - 4	Very Loose		ower Case Adjective	35% - 50%	
γ	T	Thin Wa		,	2 -		Soft		5 - 10	Loose		ome	20% - 35%	
Ę	U		bed Piston	1	5 -		Medium S		11 - 24	Medium De	I	ttle	10% - 20%	
5	0	Open Er			9 -		Stiff		25 - 50	Dense	I	race	1% - 10%)
S		Auger Fl			16 -		Very Stiff Hard		> 50 VOR - Weight	Very Dense				
9	. (:	L'Ore Ha	TTAI		. 31 -	hu	Hara	1 V	VUR - Weight	DI ROO	1	ENO	1011	

WOR - Weight of Rod

WOH - Weight of Hammer

ENGLISH

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

New Hampshire

PROJECT NAME **BEDFORD 13527** DESCRIPTION US Route 3 Bridge Replacement

> 9 - 15

> 60

16 - 30 31 - 60

Stiff

Hard

Very Stiff

Very Hard

0

NR

TB-06

Open End Rod

Auger Flight

Core Barrel

Not Recorded

BRIDGE NO. _

		GROUN	DWATE	₹		EQUIP	MENT	SAMPLER	CASING	CORE
DATE	TIME	DEPTH	ELEV.	воттом	воттом	TYPE:		S	NW	NX
DATE	TIME	(ft)	(ft)	OF CASING	OF HOLE	SIZE I.D.	(in):	1.375	3	1.875
8/11/10	12:20 am	4.9	225.2	5.6	5.6	HAMMER	WT. (lb):	140	DRILI	RIG
8/12/10	7:45 am	5.0	225.1	None	5.6	HAMMER	FALL (in):	30	CME 45-C	`Track ria
8/13/10	8:00 am	5.0	225.1	None	5.5	HAMMER	TYPE:	Automatic	CIVIL 45-C	, mack ng

BORING NO. **B07** SHEET NO. ____1__ OF _ STA. <u>114+50</u> OFF. <u>LT 150</u> BASELINE US Route 3 ELEVATION (ft) ____ 230.1 START/END ____8/11/10 / 8/11/10 DRILLER __ J. Pierce (NHDOT)

1% - 10%

ENGLISH

DATE	TIME	DEPTH (ft)	(ft)	BOTTOM OF CASING	OF HOLE	SIZE I.D.	(in):	1.375	3	1.875	INSPECTOR _	J. Piero	:e
8/11/10	12:20 am		225.2	5.6	5.6	HAMMER		140		_ RIG	CLASSIFIER _	DRR	
8/12/10	7:45 am		225.1	None	5.6		R FALL (in):	30		Track rig			
8/13/10	8:00 am	5.0	225.1	None	5.5	HAMMER	TYPE:	Automatic	CIVIE 45-C	Tracking	EAST/NORTH (ft)	1036580/1	01470
DEPTH (ft)		CHANGE (ft)	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE		FIELD	O CLASSIF	ICATION .	AND REMARKS		STRAT SYMB
0 —	DEPTH	ELEVATION	0.5 ft			(ft) 0.0	Disale						31WB
	0.4	229.7	25/0.3	S1	0.4 [50]	0.8	Black,	fibrous TOPS	OIL OIL (based c	n drilling ob	servations)-		~~
. 5 —	0.8	229.3	20.0.0	C1	4.7 [98]	0.8	slightly w/ coa discolo well-de	-A ately hard to h rfractured, gr rse-grained G red, few silt-o	PPROXIMA nard, modera ey and black GRANITE fro coated. Folia	TE BEDROG ately to slight x, coarse-me m start of ru	CK SURFACE- tly weathered, modera dium grained, GNEIS in to 1.7'. All joint surfa w to steep, moderatel	S. Íntruded aces are	
						5.6		D-	ttama of Frank	ti @ [.6 ft (El. 224.5)		<i>Y//</i>
- 10 —													
- 15 —													
- 20 —													
- 25 —													
Sampler S SL T U O	Large S	d Split Spoo poon (O.D.: all Tube rbed Piston	= 3 in)	Blows/ 0 - 2 - 5 - 9 -	1 4 8	E SOILS Consisten Very Soft Soft Medium S	tiff	NON-COH Blows/foot 0 - 4 5 - 10 11 - 24 25 - 50	ESIVE SOILS Density Very Loose Loose Medium De	e Lo So ense Li	bil Descriptions apitalized Soil Name ower Case Adjective ome	Proportion Major Comp 35% - 50% 20% - 35% 10% - 20% 1% - 10%	

25 -

> 50

50

WOR - Weight of Rod

WOH - Weight of Hammer

Dense

Very Dense

Trace

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

9 - 15 16 - 30 31 - 60

> 60

0

NR

TB-06

Open End Rod

Auger Flight

Core Barrel

Not Recorded

Very Stiff

Very Hard

Stiff

Hard

25 - 50

WOR - Weight of Rod

WOH - Weight of Hammer

> 50

Trace

1% - 10%

ENGLISH

Dense

Very Dense

PROJECT NAME **BEDFORD 13527**

New Hampshire

N/A BRIDGE NO.

DESCRIPTION US Route 3 Bridge Replacement GROUNDWATER **EQUIPMENT** SAMPLER **CASING CORE** DATE TIME DEPTH ELEV. BOTTOM BOTTOM TYPE: NW NX

BORING NO. **B08** SHEET NO. ____1__ OF ___ STA. <u>114+90</u> OFF. <u>LT 250</u> BASELINE US Route 3 ELEVATION (ft) ___ 220.1 START/END <u>8/11/10 / 8/11/10</u> DRILLER J. Pierce (NHDOT)

	DATE	TIME	DEPTH	ELEV.	BOTTOM	воттом _	TYPE:		S	NW	NX	DRILLER		
	Ditte	''''-	(ft)	(ft)	OF CASING	OF HOLE	SIZE I.D.		1.375	3	1.875	INSPECTOR	J. Piero	<u>e</u>
	8/11/10	10:20 am	3.7	216.4	5.0	8.2	HAMMER	R WT. (lb):	140	DRILI	RIG	CLASSIFIER	DRR	
Ì	8/11/10	12:30 pm		215.0	None	7.9	HAMMER	R FALL (in):	30					
ı	8/12/10	8:00 am	6.9	213.2	None	7.9	HAMMER	R TYPE:	Automatic	CME 45-C	Frack rig	EAST/NORTH (ft)	1036638/1	61562
ľ						CAMPLED	DEPTH			l.				
	DEFIN	STRATUM	CHANGE (ft)	BLOWS	SAMPLE	SAMPLER RECOVERY	RANGE		FIELD	CI ASSIE	ΙΟΔΤΙΟΝ	AND REMARKS		STRATUM
	(ft)	DEPTH	ELEVATION	PER 0.5 ft	NUMBER	(ft) [%]	(ft)		1 1666	OLAGGII	IOATION	AND INCINATIO		SYMBOL
ŀ	- 0 -	0.2	210.0	1			0.0	- Dii-	file TODO	011				
		0.3	219.9	l			0.0		fibrous TOPS					$\sim\sim$
		1.0	219.1	5	S1	0.5 [25]				n, FINE SAI	ND, some si	t, little gravel, occasion	nai fiber _	/ · · · · · ·
				5		0.0 [20]		\-SUBS	OIL-				/	
				5	i		2.0							Δ Δ
				7			2.0		h brown FINI	SAND sor	me medium	sand, some silt, little o	coarse	
				10	S2	1.0 [71]		sand		,		,,		Ja 14 a
			040 =	40/0.4			3.4			-0	SLACIAL TIL	1_		
		3.4	216.7	10/011			3.4	$\overline{}$	Α.					
									-A	PPROXIMA	I E BEDKO	CK SURFACE-		V2X(///)
	- 5 -							Moder	ataly hard to h	ard coverel	v to modera	tely weathered, extrem	achy to —	
	J													<i>\\\7</i> 7\\\
					C1	4.5 [94]						rk yellowish brown to		V//>X/
												e-grained GRANITE th		XXXXX
											l' to 7.1'. Ap	proximately 0.3' of core	e left in	
									nable to retrie					K///X*/
								RQD:	1.4 / 4.8 = 29	%				
							8.2	1						
							0.2							1
									Bot	ttom of Explo	oration @ 8	.2 ft (El. 211.9)		
ŀ	− 10 −													
L	– 15 –													
	13													
90														
2:21:57 PM TB-06														
_														
효														
57														
7	- 20 -													
9							1							
/20							1							
/20							1							
6							1							
G							1							
Ö.							1							
GS							1							
Z							1							
9							1							
3B							1							
빤	- 25 -	1					1							
\leq														
찟														
527							1							
135							1							
Ó							1							
S							1							
Ä							1							
El S							1							
SINTWIPROJECTS/BEDFORD/13527/ROUTE3BORINGS.GPJ 9/20/2010		<u> </u>	L	<u> </u>		00/:		<u> </u>		= 0 1 /= 0 = ··	. 1			
S		Identifica				COHESIVE				ESIVE SOILS		oil Descriptions	<u>Proportion</u>	
핅	S		d Split Spoo		Blows		Consisten	cy E	Blows/foot	<u>Density</u>		apitalized Soil Name	Major Comp	onent
R	SL	Large Sp	oon (O.D.:	= 3 in)	0 -	1 \	/ery Soft		0 - 4	Very Loose	e Lo	wer Case Adjective	35% - 50%	
Ā	Т	Thin Wa		•	2 -		Soft		5 - 10	Loose		ome	20% - 35%	
≧	U		bed Piston		5 -		Medium S	itiff -	11 - 24	Medium De		ttle	10% - 20%	
£	Ō	Onen Er			9 -		Stiff		25 - 50	Dense	I	ace	1% - 10%	

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

New Hampshire

PROJECT NAME **BEDFORD 13527**

N/A BRIDGE NO.

DESCRIPTION US Route 3 Bridge Replacement GROUNDWATER SAMPLER **EQUIPMENT CASING CORE** DEPTH ELEV. BOTTOM BOTTOM TYPE:

BORING NO. **B09** SHEET NO. ____1__ OF ___ STA. 115+00 OFF. LT 85 BASELINE US Route 3 ELEVATION (ft) ___ 237.1 START/END <u>8/11/10 / 8/11/10</u> DRILLER J. Pierce (NHDOT)

DATE	TIME	DEPTH	ELEV.	воттом	воттом	TYPE:		S	NW	NX		Pierce (INHL	
		(ft)		OF CASING		SIZE I.D.	(in): R WT. (lb):	1.375 140	3	1.875	INSPECTOR _	Doug Ro	
8/12/10	7:45 am	6.0	231.1	4.6	9.4		R FALL (in):	30		L RIG	CLASSIFIER _	DRR	
						HAMMER	. ,	Automatic	CME 45-C	Track rig	EAST/NORTH (ft)	1036619/	<u> 161397</u>
DEPTH	STRATUM	CHANGE (ft)	BLOWS	CAMPLE	SAMPLER	DEPTH		•	•				STRAT
(ft)	DEPTH	ELEVATION	PER 0.5 ft	SAMPLE NUMBER	RECOVERY (ft) [%]	RANGE (ft)		FIELD	O CLASSIF	CATION	AND REMARKS		SYME
0 —			1	+	(11) [70]	0.0	Davidah	navina filonovia	to Income TO	NDCOII			~:^
	0.4	236.7	3				Dark v	rown, fibrous	n FINE SAI	VD some si	It to "silty", trace fine	gravel	
	1.0	236.1	9	S1	1.0 [50]			onal root, fibe				graver,	Til.
			7	7		2.0							Δ
			9			2.0					INE SAND, some silt		11/4
			12 17	S2	1.2 [60]					ace medium	sand, occasional sev	verely	بد الا
			1 17	3		4.0		ered rock frag		SLACIAL TIL	1		
			35	S3	0.5 [83]	4.0	_	ish arev-arevi			IE SAND, some silt, I	little-trace	
5 —	4.6	232.5	23/0.1			4.6					veathered rock fragm		X
5							throug						
								-A	PPROXIMA	TE BEDRO	CK SURFACE-		
							Hard, s	slightly to very	slightly wea	athered, sou	nd to slightly fracture	d, grey and	
				C1	4.8 [100]		black,	coarse-mediu	ım grained, (GNEISS. Int	ruded w/ coarse-grain	ned,	
								11E from 4.6° an d well-defir			un. Foliation is mode	rate to	
								4.2 / 4.8 = 88		alocol i iibic.			
						9.4			Ham of Fort		4 ft /FL 007 7\		Y///
10 —								Ro	nom of Expl	oration @ 9	.4 ft (El. 227.7)		
15 —													
20 —													
05													
25 —													
	Identifica			1	COHESIVI				ESIVE SOILS		oil Descriptions	Proportion	
S		d Split Spo		Blows		Consisten	icy i	Blows/foot	Density		apitalized Soil Name	Major Comp	
SL T	Large Sp	poon (O.D. all Tube	– sm)	0 - 2 -		Very Soft Soft		0 - 4 5 - 10	Very Loose Loose		ower Case Adjective ome	35% - 50% 20% - 35%	
Ü		bed Piston		5 -		Medium S	stiff .	11 - 24	Medium De		ttle	10% - 20%	
0	Open Er			9 -		Stiff		25 - 50	Dense		race	1% - 10%	, 0
A	Auger Fl			16 -		Very Stiff Hard		> 50 NOR - Weight	Very Dense	e			
C	Lore Ra	LIEI		1 31 -	nu l	marn		VUR - WEIGHT	OT HOO		ENO		

WOR - Weight of Rod

WOH - Weight of Hammer

ENGLISH

31

> 60

Very Hard

Hard

С

NR

TB-06

Core Barrel

Not Recorded

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION



MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME **BEDFORD** 13527 N/A BRIDGE NO.

US Route 3 Bridge Replacement DESCRIPTION **EQUIPMENT GROUNDWATER** SAMPLER **CASING** CORE TYPE NW NX BOTTOM BOTTOM OF CASING OF HOLE DEPTH ELEV. DATE TIME SIZE I.D. (in): 1.375 1.875 (ft) (ft) 3 HAMMER WT. (lb): 140 8/12/10 12:15 pm 4.9 226.2 31.6 31.6 DRILL RIG HAMMER FALL (in): 30 8/12/10 12:35 nm 5.4 225.7 31.6 31.6

BORING NO. **B10** SHEET NO. OF STA. 115+50 OFF. LT 170 US Route 3 BASELINE ELEVATION (ft) _ 231.1 START/END 8/12/10 / 8/12/10 DRILLER J. Woodward (NHDOT) INSPECTOR Woodward/Rogers **DRR** CLASSIFIER 1036684/161472 H (ft)

STRATUM

SYMBOL

	8/12/10	12:35 pm		225.7	31.6	31.6		FALL (in):	30	CME 45-C Track rig	EAST/NORTH (ft)	1036684
	8/13/10	8:00 am	15.1	216.0	None	31.5	HAMMER	TYPE:	Automatic	OWE TO O TRUCKING	LAST/NORTH (II) _	
	DEPTH (ft)		CHANGE (ft) ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)		FIELD	CLASSIFICATION	AND REMARKS	
	- 0 -	0.3 1.0	230.8 230.1	1 6 5	S1	0.9 [45]	0.0	_ Dark y	ellowish browi	greyish brown, fibrous to n, FINE SAND, some si d, occasional fiber -S	o loamy TOPSOIL It to "silty", trace gravel SUBSOIL-	, trace
		3.1	228.0	7 10	S2	0.5 [45]	2.0	little gr		l dark yellowish brown, f e coarse-medium sand,		
	- 5 -	0.1	220.0	13/0.1	C1	4.5 [94]	7.9	Modera fracture weather and ste silt-coa near-he Approx	-Al ately hard to h ed, grey and bering from 3.1' eep to shallow ated. Fractures orizontal. Folia imately 0.3' o'	PPROXIMATE BEDROG lard, slightly weathered a lack, coarse-medium gut-3.2'. Joints/fractures audipping. All joint surfacts of 65-70° at 3.3' and 3 lation is steep to moderate f core left in hole.	to fresh, moderately to rained, GNEISS. Zone re very close to closely es are discolored, few a 8.8', others are shallow	of severe spaced are
	— 10 —				C2	black, coarse-mediu and shallow dipping to moderate, where recovered from C1. RQD: 3.9 / 4.6 = 85			coarse-medium allow dipping erate, where or red from C1.	eathered, moderately to m grained, GNEISS. Joi w/ exception of 50° frac discernible. Approximate %	ints/fractures are close ture at 11.5'. Foliation i	ly spaced is shallow
	— 15 —				C3	4.8 [100]	12.5 12.5 17.3	grained and sh to shal	d, GNEISS. Jo allow dipping.	o moderately fractured, pints/fractures are close joint surfaces are irreguly well-defined.	to moderately closely s	spaced
/20/2010 Z:ZZ:00 PM 1B-06	- 20 -				C4	4.8 [100]	17.3	grained dipping modera	d, GNEISS. Jo		ately closely spaced an	d shallow
:DFORD/135Z//ROUTE3BORINGS.GPJ 9/	- 25 -				C5	4.6 [96]	22.1	and bla spaced surface coated well-de unable	ack, coarse to I and shallow e is undulating w/ silt. Noted	eathered to fresh, slight medium grained, GNEI dipping w/ exception of g and polished. Joint sur temporary water loss at o moderate. Approximat	SS. Joints/fractures are 70° fracture at 25.3'. Jo face at start of run is h this joint. Foliation is	e closely pint leavily
-DFORD/1.							26.9			ard, very slightly weather		

S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010 2:22:00 PM TB-06

TB-06

NR

Not Recorded

ightly fractured to sound, grey and black, coarse-medium grained, GNEISS. Quite "schistose"

Sample	r Identification	COH	HESIVE SOILS	NON-CO	HESIVE SOILS	Soil Descriptions	<u>Proportion</u>	
S	Standard Split Spoon	Blows/foot	Consistency	Blows/foot	<u>Density</u>	Capitalized Soil Name	Major Component	
SL	Large Spoon (O.D.= 3 in)	0 - 1	Very Soft	0 - 4	Very Loose	Lower Case Adjective	35% - 50%	
T	Thin Wall Tube	2 - 4	Soft	5 - 10 Loose		Some	20% - 35%	
U	Undisturbed Piston	5 - 8	Medium Stiff	11 - 24	Medium Dense	Little	10% - 20%	
0	Open End Rod	9 - 15	Stiff	25 - 50	Dense	Trace	1% - 10%	
Α	Auger Flight	16 - 30	Very Stiff	> 50 Very Dense				
С	Core Barrel	31 - 60	Hard	WOR - Weigh	nt of Rod	ENGL	ISH	
	=	1	A Zeron a Li Lerond	1 14/011 14/		ENGLISH		

WOH - Weight of Hammer

> 60

Very Hard

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION



BORING NO. B10

SHEET NO. 2 OF 2

STA. 115+50 OFF. LT 170

BASELINE US Route 3

ELEVATION (ft) 231.1

PROJECT NAME BEDFORD 13527 BRIDGE NO. N/A
DESCRIPTION US Route 3 Bridge Replacement

DESCI	RIPTION				e Replac		ELEVATION (ft)231.	.1 1
DEPTH (ft)	STRATUM (CHANGE (ft) ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)	FIELD CLASSIFICATION AND REMARKS	STRATU
- 30 -	_			C6	4.9 [104]	31.6	from start of run to 27.7'. Joints/fractures are close to moderately closely spaced. Joint surfaces are generally irregular and rough. Zone of extreme fracturing from 27.6'-27.8' w/ multiple 60-65° fractures. Foliation is moderate to steep. Additional 0.2' of core picked up from C5. ROD: 4.5 / 4.7 = 96%	
						31.0	Bottom of Exploration @ 31.6 ft (El. 199.5)	*///
35 –								
40 -	-							
45 -								
50 -								
55 —	-							
20								
- 60 —								
- 65 -								
00								

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

> - 15 - 30 - 60 9

31

> 60

Hard

Very Hard

WOR - Weight of Rod

WOH - Weight of Hammer

ENGLISH

NR

TB-06

Core Barrel

Not Recorded

BORING NO. New Hampshire

SHEET NO. ____1__ OF __ STA. 115+04 OFF. LT 08

B11

BASELINE US Route 3 ELEVATION (ft) ___ 241.3

START/END <u>8/18/10 / 8/18/10</u> DRILLER C. Cleveland (NHDOT)

PROJECT NAME **BEDFORD 13527** N/A BRIDGE NO. DESCRIPTION US Route 3 Bridge Replacement **GROUNDWATER EQUIPMENT** SAMPLER **CASING** CORE DEPTH FLEV BOTTOM BOTTOM NW TYPE:

	DATE	TIME	DEPTH	ELEV.	BOTTOM OF CASING	воттом	TYPE:	(i-)-	SL	NW	NX 4.075	DRILLER <u>C. C</u>		
	8/18/10	9:55 am	(ft) 7.0	(ft) 234.3	4.0	8.9	SIZE I.D.	(IN): R WT. (lb):	3 140	3 DBII	1.875 L RIG	INSPECTOR _	Doug Rog DRR	
	8/18/10	10:10 am		234.0	4.0	8.9	HAMMER	R FALL (in):	30		5-C Trlr	CLASSIFIER _		
							HAMMER	R TYPE:	Automatic	CIVIL 4	<u> </u>	EAST/NORTH (ft)	1030010/	T T
	DEPTH (ft)	STRATUM DEPTH	CHANGE (ft) ELEVATION	PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVER' (ft) [%]			FIELD	CLASSIF	FICATION	AND REMARKS		STRATUM SYMBOL
	- 0 -	0.7	0.40.0						-ASPHAL	T- (cored w	// 6" diamon	d and submitted to lal	b)	
		0.7	240.6		S1 *	1.8 [90]	0.7	Dark y	ellowish brow	n, gravelly C	COARSE-FII	NE SAND, trace silt		
		3.8	237.5		S2 *	1.2 [86]	2.7	Dark y trace s		n, MEDIUM	-FINE SANI	D, little gravel, little co	oarse sand,	
	_	3.0	237.5				4.1	Grey,				CK SURFACE- y weathered ROCK		
	<u> </u>				C1	4.6 [96]	8.9	greyish PEGM extrem Occas	n brown-grey a IATITE from 5 ne fracturing fr	and black, c 5.2'-7.7'. Zor om 6.3' to 6 of the core a	oarse-mediune of modera 6.9'. All joint	ered, moderately fract um grained, GNEISS. ately severe weatherin surfaces are heavily: Foliation is irregular.	Intruded w/ ng and	**
									Bot	tom of Expl	oration @ 8	3.9 ft (El. 232.4)		
RINGS.GPJ 9/20/2010 2:22:02 PM TB-06	- 15 - - 20 -							* Indic	ates sample b	orought into l	laboratory fo	or analysis		
S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/20	_ 25 <i>_</i>													
ECT8		Identifica				COHESIV		_		ESIVE SOILS	1 -	oil Descriptions	Proportion	
ROJI	S SL		d Split Spo boon (O.D.		Blows 0 -		Consisten Very Soft	CY !	Blows/foot 0 - 4	Density Very Loose		apitalized Soil Name ower Case Adjective	Major Comp 35% - 50%	
WP	Т	Thin Wa	all Tube	,	2 -	4	Soft		5 - 10	Loose	s	ome	20% - 35%	1
SINT	U	Undistur Open Er	bed Piston nd Rod	1	5 -	8 15	Medium S Stiff		11 - 24 25 - 50	Medium De	I	ittle race	10% - 20% 1% - 10%	
	Α	Auger F	light		16 -	30	Very Stiff		> 50	Very Dense				
9	C	Core Ba	rrel		31 -	60	Hard	1 1	NOR - Weight	ot Rod	1	ENO	1011	

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

New Hammshire

N/A BRIDGE NO.

PROJECT NAME **BEDFORD** 13527 US Route 3 Bridge Replacement **DESCRIPTION**

GROUNDWATER EQUIPMENT SAMPLER **CASING CORE** TYPE NW NX ELEV. BOTTOM BOTTOM OF CASING OF HOLE DEPTH DATE SIZE I.D. (in): 1.875 1.375 (ft) 3

BORING NO. **B12** SHEET NO. OF STA. 115+70 OFF. LT 110 US Route 3 BASELINE ELEVATION (ft) 238.8 8/12/10 / 8/13/10 START/END _ DRILLER J. Woodward (NHDOT) INSPECTWRodward/RogersDoug Rogers **DRR** 1036693/161409

STRATUM SYMBOL

	DAIL	TIIVIL	(ft)	(ft)	OF CASING		SIZE I.D.		1.375	3	1.875	INSPECT VIR odwar	d/Rogers
	8/12/10	12:30 pm	13.8	225.0	18.9	18.9	HAMMER		140	<u>DRILI</u>	<u>L RIG</u>	CLASSIFIER	DRR
	8/12/10	12:45 pm	13.8	225.0	18.9	18.9 28.5	HAMMER	FALL (in):	30 Automatic	CME 45-C	Track rig	EAST/NORTH (ft)	1036693/1
ı	8/13/10	8:00 am	15.8	223.0	28.5	<u> </u>		ITPE.	Automatic				
	DEPTH (ft)		CHANGE (ft) ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)		FIELD	CLASSIF	ICATION .	AND REMARKS	
	– o –	0.3	238.5	WOH			0.0	→ Dark b	rown, fibrous	TOPSOIL			
		1.0	237.8	2 6	S1	1.0 [50]			ellowish brow onal fiber		ND, some sil SOIL-	lt, little gravel, trace coar	se sand,
				14	·		2.0						
				15 15 17 14	S2	1.0 [50]	4.0	mediur	m sand, little-t	race coarse -C	sand SLACIAL TIL		
		15	224.2	30	S3	0.2 [40]	4.0 4.5					e silt, little gravel, little co	oarse _
	- 5 -	4.5	234.3				4.5	⊤\sand, d	occasional sev			agment CK SURFACE-	
	· ·				C1	4.4 [92]	9.3	slightly coarse through fractur closely which	ately hard to he to moderately -medium grain hout the run. It ing from 7.3' to spaced. Mos	ard, modera y fractured, ned, GNEIS PEGMATITE to 7.5' and 8 t are shallov 8.4' to 8.9'.	ately to mode grey and bla S. Intruded E intrusion fi 3.3' to 8.9'. Joy V dipping w/	erately severely weather cardely severely weather leck w/ traces of yellowish w/ coarse-grained GRA rom 8.7'. Zones of extreioints/fractures are close exception of 80-85° fraction-discernible.	n brown, NITE me to very
	4.0						9.3						
	— 10 —				C2	4.5 [94]		yellowi INTRU dipping and/or	sh brown-brov ISION. Joints/	wnish yellow fractures ar contal. Entire esent.	vand grey, o e close to ve	d, moderately fractured, coarse-grained, PEGMA' ery closely spaced and s are is stained. Some mind	TITE hallow
							14.1 14.1						
N ID-00	- 15 -				C3	4.8 [100]	18.9	slightly w/ PEC GRAN modera 15.1'-1 shallov	r fractured, gre GMATITE from ITE exist throu ately severe w 5.3' and 16.0	ey and black in start of rui ughout the r veathering ai '-16.2'. Joint oped joint su	x, coarse-me n to 14.5'. M emainder of nd extreme t ts/fractures a	slightly weathered, modulation grained, GNEISS. Illinor intrusions of coarse the run. Zones of sever fracturing from 14.1'-14. are closely spaced, mos 1'. Foliation is non-disce	Intruded e grained e and 3', t are
_							18.9						
31.3 3/20/2010 2.22.03	- 20 -				C4	4.8 [100]		Coarse modera 21.8'. I	e-grained GRA	ANITIC INTE spaced and ell-defined, s	RUSION fror shallow dipp	to coarse grained, GNE m 18.9' to 19.5'. Joints a ping. Partially stepped joi erate.	are
20.5							00.7						
SSZ/ROUTESBORING	– 25 –				C5	4.8 [100]	23.7	black, 24.4' to shallov	coarse-mediu o 25.7'. Joints v dipping. Joir	m grained, (/fractures ar it surface at	GNEISS. Int re close to m 27.6' is iron	ly fractured to sound, grounded w/ PEGMATITE for the production of	rom d and from
מאטיטי							28.5		4.7 / 4.8 = 98				

S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010 2:22:03 PM TB-06

TB-06

Not Recorded

Description Continues on Next Page

Sample	<u>Identification</u>	COHES	SIVE SOILS	NON-CO	HESIVE SOILS	Soil Descriptions	<u>Proportion</u>
S	Standard Split Spoon	Blows/foot	Consistency	Blows/foot	<u>Density</u>	Capitalized Soil Name	Major Component
SL	Large Spoon (O.D.= 3 in)	0 - 1	Very Soft	0 - 4	Very Loose	Lower Case Adjective	35% - 50%
Т	Thin Wall Tube	2 - 4	Soft	5 - 10	Loose	Some	20% - 35%
U	Undisturbed Piston	5 - 8	Medium Stiff	11 - 24	Medium Dense	Little	10% - 20%
0	Open End Rod	9 - 15	Stiff	25 - 50 Dense		Trace	1% - 10%
Α	Auger Flight	16 - 30	Very Stiff	> 50 Very Dense			
С	Core Barrel	31 - 60	Hard	WOR - Weigh	t of Rod	ENGL	ISH
NR	Not Recorded	> 60	Very Hard	WOH - Weigh	t of Hammer		

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION



BORING NO	. B12
SHEET NO	2 OF 2
STA. 115+70	OFF. LT 110
BASELINE	US Route 3

PROJECT NAME **BEDFORD 13527** DESCRIPTION US Route 3 Bridge Replacement

_ BRIDGE NO. ___N/A 238.8 ELEVATION (ft)

	DEPTH (ft)		CHANGE (ft)	DED	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)		STRATUM SYMBOL
	- 30 -				C6	2.9 [153]	30.4 30.4	Hard, similar to C5 w/ PEGMATITE INTRUSION from 28.9' to end of run. Some minor pitting of core surface in close proximity to joint at 30.0'. Foliation is steep within the GNEISS. RQD: 2.9 / 1.9 = 153%	
					C7	4.0 [87]		Hard, very slightly weathered, slightly fractured to sound, grey, coarse-grained, PEGMATITE INTRUSION. Joints/fractures are closely spaced and shallow dipping. Joint surfaces are rough to very rough. Occasional minor crack of core surface is present. Approximately 0.6' of core left in hole, unable to retrieve. RQD: 3.9 / 4.6 = 85%	
	- 35 -	-					35.0	Bottom of Exploration @ 35.0 ft (El. 203.8)	<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>
	- 40 -								
	- 45 -								
9	- 50 -								
2010 2:22:04 PM TB-06									
GPJ 9/20/	- 55 -								
3527\ROUTE3BORINGS.									
TB-06 S:\GiNTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010 2:	- 60 -								
TB-06 S:\GINTW	- 65 -	_							

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION



MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME **BEDFORD** 13527 N/A BRIDGE NO.

US Route 3 Bridge Replacement DESCRIPTION **GROUNDWATER** EQUIPMENT SAMPLER **CASING CORE**

BORING NO. **B13** SHEET NO. _ OF_ STA. 116+25 OFF. LT 30 US Route 3 BASELINE _ ELEVATION (ft) _ START/END <u>8/11/10 / 8/12/10</u> DOT) ers 1321

L			CITOOIVE	JVVATER			EQUIP	IVILINI	SAMPLER	CASING	CORE	STARTICIND		
			DEPTH	ELEV.	воттом	воттом	TYPE:		S	NW	NX	DRILLER J. Wood	lward (NF	<u> </u>
	DATE	IIME	(ft) (ft) 12:30 pm 6.6 235.3 12:45 pm 5.1 236.8			OF HOLE	SIZE I.D.	(in):	1.375	3	1.875	INSPECTOR[Doug Rog	aers l
ł	8/11/10	12:30 nm		235.3	24.2	24.2	HAMMER	R WT. (lb):	140	DRILL	PIG			
ł	8/12/10			_	None	33.0		R FALL (in):	30			CLASSIFIER	DRR	
ł	8/12/10	2:30 pm	5.3	236.6	None	33.0	HAMMER		Automatic	CME 45-C	Track rig	EAST/NORTH (ft)	1036733/1	161321
ł	0/12/10				I				ratomatio					
	DEPTH (ft)	STRATUM (ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)		FIELD) CLASSIF	ICATION A	AND REMARKS		STRATUM SYMBOL
ĺ	- 0 -	0.4	241.5		S1	0.4 [70]	0.0 0.5	¬ Dark b	rown, fibrous	to loamy TC	PSOIL			
	- 5 -	0.5	241.4		C1	4.4 [92]	5.3	Modern modern INTRU severe Joints/ dipping GNEIS	-Al ately hard to hately to slightly ISION to apprily weathered, fractures are	PPROXIMA nard, modera y fractured, l oximately 4.1 extremely fr very close to f 40° at 1.0' moderate, w	-FILL- TE BEDROO ately severe light grey, co 0'. Overlies a cactured, coa o closely spa and 1.2' and	CK SURFACE- to moderately weathered parse-grained, GRANITIC a severely to moderately arse-grained, GNEISS. ced and moderately to sl 30° at 4.5'. Foliation with hible.	hallow	
	- 10 -				C2	4.8 [100]	10.1	fractur GNEIS spaced 9.5'. F	ed, grey and b SS from 5.3' to	plack, coarse 6.3'. Joints f 25° at 6.5' -defined, mo	e-medium gr /fractures ar and 7.6', 30'	otly weathered, sound to alined, GNEISS. GRANI's moderately close to close to 9.6', 40° at 8.4' and	TIČ osely	
					C3	4.7 [98]	10.1	black, moder Foliation	coarse-mediu	m grained, (paced and s o moderate.	GNEISS. Joi	y fractured to sound, gre nts/fractures are close to ng (all are less than 10°)	Ď	
U6 PIM IB-U6	- 15 -				C4	4.5 [94]	14.9	black, 16.9' to and sh approx core w	coarse to med end of run. allow dipping	dium grained Joints/fractu to near-hori and is mode . Unable to r	l, GNEISS. E res are close zontal. Foliat rate within th	y fractured to sound, gre Becomes medium-graine e to moderately closely s tion is discernible only fr nis zone. Approximately	ed from paced om	
URINGS.GPJ 9/20/2010 2:22.	- 20 -				C5	5.0 [111]	19.7 24.2	black, 26.7'. 50° fra where	medium to co Joints/fracture acture at 23.6'	arse-grained es are closel and 65° frad dditional 0.5	d, GNEIŚS. I y spaced and cture at 23.7	slightly fractured, grey a Becomes coarse-grained d shallow dipping w/ exce ". Foliation is moderate t ked up from C4.	from eption of	
-				C6	4.8 [100]		and bla moder moder Replac continu	ack, coarse-m ately closely s ate and well-d	edium grain paced and s lefined. Dam and reaming un.	ed, GNEISS hallow dippinage to Nx di	rately fractured to sound . Joints/fractures are clo ng. Foliation is steep to amond occurred at 24.7' nent of core barrel and	se to		
o ี้						COLIECTA	29.0						<u>KUUKKU</u>	

COHESIVE SOILS Sampler Identification Standard Split Spoon Blows/foot Consistency Large Spoon (O.D.= 3 in) 0 Very Soft Thin Wall Tube 2 5 Т Soft Undisturbed Piston Medium Stiff U 8 0 Open End Rod 9 15 Stiff Auger Flight 16 30 Very Stiff

31

> 60

Hard

Very Hard

Core Barrel

Not Recorded

S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010 2:22:06 PM TB-06

TB-06

NR

NON-COHESIVE SOILS Blows/foot **Density** 0 Very Loose 5 10 Loose 11 -24 Medium Dense 25 50 Dense Very Dense WOR - Weight of Rod

WOH - Weight of Hammer

Soil Descriptions **Proportion** Capitalized Soil Name Major Component Lower Case Adjective 35% - 50% 20% - 35% Some 10% - 20% Little Trace 1% - 10%

ENGLISH

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION



BORING NO. B13

SHEET NO. 2 OF 2
STA. 116+25 OFF. LT 30
BASELINE US Route 3

PROJECT NAME BEDFORD 13527 BRIDGE NO. __

US Route 3 Bridge Replacement **DESCRIPTION** 241.9 **ELEVATION (ft)** SAMPLER RECOVERY (ft) [%] DEPTH RANGE STRATUM CHANGE (ft) BLOWS DEPTH SAMPLE NUMBER STRATUM SYMBOL PER 0.5 ft FIELD CLASSIFICATION AND REMARKS ELEVATION DEPTH (ft) 30 Hard, very slightly weathered to fresh, sound, grey and black, coarse-medium grained, GNEISS. Joints are moderately closely spaced. C7 4.0 [100] Fracture of 70° at 32.4'. Foliation is steep to moderate, where discernible. RQD: 4.0 / 4.0 = 100% Bottom of Exploration @ 33.0 ft (El. 208.9) 35 40 45 50 S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010 2:22:06 PM TB-06 55 60 TB-06 65

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

New Hampshire

PROJECT NAME **BEDFORD 13527** BRIDGE NO. US Route 3 Bridge Replacement DESCRIPTION

GROUNDWATER EQUIPMENT SAMPLER **CASING** CORE TYPE NW NX BOTTOM BOTTOM OF CASING OF HOLE DEPTH ELEV. DATE TIME SIZE I.D. (in): 1.375 1.875 (ft) (ft) 3 HAMMER WT. (lb): 140 8/16/10 11:45 am 236.6 4.0 29.0 36.0 DRILL RIG HAMMER FALL (in): 30 8/16/10 12:30 pm 4.9 235.7 29.0 36.0 CME 45-C Track rig

BORING NO. **B14** SHEET NO. _ OF STA. <u>116+42</u> OFF. <u>RT 20</u> US Route 3 BASELINE _ 240.6 ELEVATION (ft) _ START/END ____8/16/10 / 8/16/10 DRILLER ___ J. Pierce (NHDOT) **Doug Rogers** INSPECTOR _ **DRR** CLASSIFIER 1036741/161269 EAST/NORTH (ft)

STRATUM

SYMBOL

0, 1	6/10	12:30 pm	4.9	235.7	29.0	36.0		TYPE:	+	CME 45-C Trac	ck rig	EAST/NORTH (ft)	103
DE	DTU	STRATUM	CHANGE (ft)	BLOWS	CAMPLE	SAMPLER	DEPTH					, ,	
		DEPTH		PER	NUMBER	RECOVERY	RANGE		FIEL	D CLASSIFICAT	TION	AND REMARKS	
_	0 –	0.3	240.4	2 3	S1	1.1 [55]	0.0	Loose	, dark yellowis	sh brown, COARS	E-FINI	E SAND, some grave	l to
		2.2	238.4	7			2.0	Ū	ellowish brow	F- n, COARSE-FINE	SANI		silt
				54/0.3	32	0.6 [02]	3.3	Grey,					
_	5 —				C1	4.6 [96]	0.4	moder Occas very of 6.4' to some Appro	rately fracture sional thin coa lose to closely 7.8' w/ heavy minor pitting oximately 0.2' oximately	d, grey and black, arse-grained GRAN y spaced. Fracture y discoloration/stair of core surface is por core left in hole,	coarse NITIC I s of 70 ning of presen	e-medium grained, GI NTRUSION. Joints/fr)° at 5.5', 80-85° exte i joint surface. Few cr t. Foliation is shallow	NÉISS. actures nding fr acks ar
							8.1						
- 1	10 —				C2	5.0 [104]		slightl GNEI: shallo well-d	y fractured to SS. Joints/frac w dipping. Mo efined, shallow	sound, grey and b ctures are close to ost all joints are dis w to steep. Addition	lack, c mode colore	oarse-medium graine rately closely spaced d/stained. Foliation is	ed, and
- 1	15 –				C3	4.8 [100]	12.9 12.9	sound GRAN mode 70-75 fractu within	I, grey and bla NITIC INTRUS rately closely so rectures from re zone. Folian the multiple f	ack, coarse-mediur SION from 13.5' to spaced. High angle om 14.3' to 14.9'. F tion is moderate to racture zone.	n grair 14.2'. e fractu Planar	ned, GNEISS. Coarse Joints/fractures are oures of 55° at 17.3' ar joint surfaces within t	e-graine close to nd multi this mul
- 2	20 —				C4	4.8 [100]	17.7	and bl space are sh	ack, coarse-n d. Fractures o allow dipping.	nedium grained, G of 55° at 19.2', 55- . Foliation is steep	NEISS 60° at	6. Joints/fractures are 20.3' and 65° at 21.2	closely 2'. All otl
- 2	25 –				C5	4.9 [100]	22.5 22.5	black, INTRU closel All oth	coarse-medit JSIONS throu y spaced. Frad ers are shallo	um grained, GNEIS ughout the run. Joi cture of 65° at 25.0 w dipping. Foliatio	SS. Co nts/fra 6' inter	parse-grained GRANI ctures are close to make rects vertical fractures.	TIC oderate at 25.9
							27.4 27.4						
	S SL T U O A	Standard Large S Thin Wa Undistur Open En Auger F	d Split Spoo poon (O.D. all Tube rbed Piston nd Rod light	= 3 in)	0 - 2 - 5 - 9 - 16 -	/ <u>foot</u> 1 4 8 15 30	Consisten Very Soft Soft Medium S Stiff Very Stiff	tiff	Blows/foot 0 - 4 5 - 10 11 - 24 25 - 50 > 50	Density Very Loose Loose Medium Dense Dense Very Dense	C: Lo So Li	apitalized Soil Name ower Case Adjective ome ttle	Propo Major 35% 20% 10% 1%
	DE() - 1	DEPTH (ft) (ft) (7) - 0	DEPTH (ft) DEPTH DEPTH	Sampler Standard Split Spo Large Spoon (O.D. Thin Wall Tube Under the Company of the Compa	DEPTH	DEPTH CHANGE (N) PER P	DEPTH STRATU	DEPTH	DEPTH STRATUM CHANGE (ft) DEPTH ELEVATION DEPTH ELEVATION DEPTH ELEVATION DEPTH ELEVATION DEPTH ELEVATION DEPTH DEPTH ELEVATION DEPTH DEPTH ELEVATION DEPTH DEPTH ELEVATION DEPTH DEPTH	Sampler Sampler Sampler	PAMMER TYPE	Manufact Manufacture Manufact Manufact Manufact Manufacture Manufacture	MAINTENDED Matter Matter

> 60

Very Hard

TB-06

NR

Not Recorded

lack, coarse-medium grained, GNEISS. GRANITIC INTRUSION. Joints/fractures are ctures of 70° at 5.5', 80-85° extending from n/staining of joint surface. Few cracks and ce is present. Foliation is shallow to steep. hole, unable to retrieve.

eathered to fresh, moderately fractured to edium grained, GNEISS. Coarse-grained 5' to 14.2'. Joints/fractures are close to angle fractures of 55° at 17.3' and multiple .9'. Planar joint surfaces within this multiple ate to shallow, w/ exception being steep

ered, moderately fractured to sound, grey ed, GNEISS. Joints/fractures are closely 55-60° at 20.3' and 65° at 21.2'. All others steep to moderate and well-defined.

١																\sim
5	Sampler	Identifica	ation		COHESIVE SOILS					NO	N-CO	HESIVE SOILS	Soil Descriptions	<u>Proportion</u>		
	S	Standard	Split Spoo	on	Blows/foot Consistency 0 - 1 Very Soft			<u>cy</u>	Blov	ws/f	oot	<u>Density</u>	Capitalized Soil Name	e Major Component		
2	SL	Large Sp	oon (O.D.:	= 3 in)	0	-	1	Very Soft		0	-	4	Very Loose	Lower Case Adjective	35% - 50%	
-	Т	Thin Wa	II Tube		2	-	4	Soft	- 1	5	-	10	Loose	Some	20% - 35%	
:	U	Undistur	bed Piston		5	-	8	Medium S	tiff	11	-	24	Medium Dense	Little	10% - 20%	
5	0	Open Er	nd Rod		9 - 15		15	Stiff		25	-	50	Dense	Trace	1% - 10%	
j	Α	Auger Fl	ight		16	-	30	Very Stiff		> 50			Very Dense			_
3	С	Core Ba	rrel		31 - 60 Hard				WOR - Weight of Rod			t of Rod	ENGLISH			
					⊢ ' ••			l				LINGLIGHT				

WOH - Weight of Hammer

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION



BORING NO	. В14
SHEET NO	2 OF 2
STA116+42	_OFFRT_20
BASELINE	US Route 3
FI EVATION (ft)	240.6

PROJECT NAME BEDFORD 13527
DESCRIPTION US Route 3 Bridge Replacement

_____ BRIDGE NO. ____N/A_

	RIPTIO		Route				ELEVATION (ft)240.	T
DEPTH (ft)		CHANGE (ft)	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)	FIELD CLASSIFICATION AND REMARKS	STRATU SYMB0
30 —				C6	4.3 [90]	32.2	Hard, fresh, sound, grey and black, coarse-medium grained, GNEISS. Joints are moderately closely spaced. Foliation is irregular, appears mostly steep, where discernible. Approximately 0.5' of core left in hole, unable to retrieve. RQD: 4.3 / 4.8 = 90%	
35 —				C7	4.3 [100]	<u>32.2</u> 32.2	Hard, fresh, sound to slightly fractured, grey and black, coarse-medium grained, GNEISS. Intruded w/ coarse-grained GRANITE from 33.3' to end of run. Joints/fractures are moderately close to closely spaced and shallow dipping. Approximately 0.5' of core left in hole, unable to retrieve. RQD: 3.9 / 4.3 = 91%	
						36.5	Bottom of Exploration @ 36.5 ft (El. 204.1)	<i>\///2</i>
40 —								
45 —								
50 —								
55 —								
60 —								
65 —								

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

US Route 3 Bridge Replacement

PROJECT NAME **BEDFORD 13527**

DESCRIPTION

TB-06

NR

Not Recorded

New Hammshire

N/A BRIDGE NO.

GROUNDWATER EQUIPMENT SAMPLER **CASING CORE** BOTTOM BOTTOM OF CASING OF HOLE TYPE NW NX DEPTH ELEV. DATE TIME SIZE I.D. (in): 1.875 (ft) 1.375 3 (ft)

BORING NO. **B15** SHEET NO. OF 117+10 OFF. LT 135 STA. _ US Route 3 BASELINE 216.2 ELEVATION (ft) _ 8/10/10 / 8/10/10 START/END ___ DRILLER C. Cleveland (NHDOT) INSPECTORierce/RogersDoug Rogers

ENGLISH

	8/10/10	11:00 am		207.7	7.2	16.8	HAMMER		140 30	DRILL RIG		CLASSIFIER	DRR	
	8/10/10	11:15 am	8.4	207.8	7.2	16.8	HAMMER	R FALL (in): R TYPE:	Automatic	<u>CME 45-C T</u>	rlr	EAST/NORTH (ft)	1036835/	161409
	DEPTH (ft)		CHANGE (ft) ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)		FIELD	CLASSIFICAT	ΓΙΟΝ .	AND REMARKS		STRATUM SYMBOL
	- 0 -	0.2	216.0	3 4 4 5	S1	1.3 [65]	2.0		rown, fine sar dark yellowisl	h brown, COARSI	Ē-FIÑE	SAND, little-trace gra	avel, trace	
				7 11 17 14	S2	1.6 [80]	2.0	Dense trace s				E SAND, little-trace fin	ne gravel,	
	- 5 -			9 4 4 5	S3	0.9 [45]	4.0		dark yellowisl avel, slight tra		Л-FINE	E SAND, little coarse s	and, trace _	
		6.0	210.2	6 12 51/0.2	S4	0.8 [67]	6.0 7.2	Dark b		PPROXIMATE BE dark grey and blac		CK SURFACE- y severely to complete	ly	
	— 10 —				C1	4.8 [100]		to sour severe Multipl and we	nd, grey, coars weathering a	se-grained, GNEIS nd moderate to ex ractures within thi	SS. Žo treme	ely weathered, slightly in ne of moderately seve fracturing from 8.8' to e. Foliation is steep to r	re to 9.7'.	
	— 15 —				C2	4.4 [92]	12.0	coarse approx discerr	-grained, GRA imately 15.5' t	AÑITÍC GNEISS. I to end of run. Folia	Intrude	y fractured to sound, ç d w/ PEGMATITE froi s irregular, moderate w	m	
0 2:22:10 PM TB-06	- 20 -						10.0		Bott	om of Exploration	@ 16	i.8 ft (El. 199.4)		
BORINGS.GPJ 9/20/2010														
JFORD\13527\ROUTE3	— 25 —													
S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ	Sampler S SL T U O A	Standard Large Sp Thin Wa	d Split Spo boon (O.D. all Tube bed Pistor ad Rod	= 3 in)	Blows/ 0 - 2 - 5 - 9 - 16 -	1 4 8 15	E SOILS Consisten Very Soft Soft Medium S Stiff Very Stiff	tiff 2	NON-COHE Blows/foot 0 - 4 5 - 10 11 - 24 25 - 50	ESIVE SOILS Density Very Loose Loose Medium Dense Dense Very Dense	Ca Lo So Lit	pil Descriptions apitalized Soil Name wer Case Adjective ttle ace	Proportion Major Comp 35% - 50% 20% - 35% 10% - 20% 1% - 10%	
9	C	Core Bai			31 -		Hard		VOR - Weight		1	ENGL		

Sampler	Identifica	ation_				COHESI	/E SOILS			NC	N-CO	HESIVE SOILS	Soil Descriptions	Proportio	<u>n</u>
S	Standard	d Split Spo	on	Blo	ws/	foot	Consister	ncy	Blo	ws/	foot	<u>Density</u>	Capitalized Soil Name	 Major Co 	mponent
SL	Large Sp	poon (O.D.	= 3 in)	0	-	1	Very Soft		0	-	4	Very Loose	Lower Case Adjective	35% - 5	0%
T	Thin Wa	all Tube		2	-	4	Soft		5	-	10	Loose	Some	20% - 3	5%
U	Undistur	rbed Piston	1	5	-	8	Medium S	Stiff	11	-	24	Medium Dense	Little	10% - 2	.0%
0	Open Er	nd Rod		9	-	15	Stiff		25	-	50	Dense	Trace	1% - 1	0%
Α	Auger F	light		16	-	30	Very Stiff		> 5	0		Very Dense			
С	Core Ba	ırrel		31	-	60	Hard		WO)R -	Weigh	nt of Rod	FNC	21 ICH	

WOH - Weight of Hammer

> 60

Very Hard

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

US Route 3 Bridge Replacement

16 - 30 31 - 60

> 60

Very Stiff

Very Hard

Hard

> 50

WOR - Weight of Rod

WOH - Weight of Hammer

Very Dense

ENGLISH

Auger Flight

Core Barrel

Not Recorded

С

NR

DESCRIPTION



MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME **BEDFORD 13527**

N/A BRIDGE NO.

GROUNDWATER EQUIPMENT SAMPLER **CASING CORE** DEPTH ELEV. BOTTOM BOTTOM OF CASING OF HOLE TYPE: NW NX DATE TIME SIZE I.D. (in): 1.875 1.375 3

BORING NO. **B16** SHEET NO. ____1__ OF ___ STA. 117+41 OFF. LT 65 US Route 3 BASELINE _ ELEVATION (ft) __ 218.6 START/END <u>8/10/10 / 8/10/10</u> DRILLER P. Huckins (NHDOT) INSPECTOR Doug Rogers

L			(ft)	(ft)	OF CASING	OF HOLE	SIZE I.D.	` ,	1.375	3	1.875	\lrcorner INSPECTOR $_$	Doug Ro	gers
	8/10/10	11:20 am	9.6	209.0	12.4	19.9		R WT. (lb):	140	DRIL	L RIG	CLASSIFIER _	DRR	
	8/10/10	11:40 am	9.6	209.0	12.4	19.9	HAMMER	R FALL (in):	30					
r							HAMMER	R TYPE:	Automatic	iviodile E	3-52 Trk	_ EAST/NORTH (ft)	1036854/	101335
		CTDATIMA	CHANGE (ft)	BLOWS		SAMPLER	DEPTH					1		
	DEPTH	 		PER	SAIVIPLE	IDECOVEDY			FIFI D	CLASSIF	EICATION	N AND REMARKS		STRATUM
	(ft)	DEPTH	ELEVATION	PER 0.5 ft	NUMBER	(ft) [%]	(ft)			02/10011	10, 11101	THE REMARKS		SYMBOL
H	- 0 —							-ASPH	ALT.					
		0.6	218.0					-ASFI	ALI-					
				14			1.0							
				12				Dense	dark vellowis	sh brown ar	avelly COA	ARSE-FINE SAND, trac	e silt	
					S1	1.2 [60]		201100		2. 3 , g.	a.o, 00.		, o o	
				15	.						-FILL-			
				10	'├──		3.0	Danker	والمالية والمالية	- 145511114		ID little topes fine one.	_I	\bowtie
			0440	17	S2	0.8 [80]	3.0				-FINE SAI	ND, little-trace fine grave	eı,	
		3.7	214.9	45			4.0	nue-u	ace coarse sa		TE DEDD	OCK SURFACE-	/	
							4.0	⊔ord \				to slightly fractured, gre	.,	
L	- 5 —				C1	1.4 [74]						ded w/ coarse-grained (-X///X/
	Ŭ					' '		through					GRANITE	
							5.9).9 / 1.9 = 47 ¹		nead note	d from 5.4' to 5.9'.		$\rangle \rangle \rangle \rangle \rangle \rangle$
				5			6.0	RQD. (J.9 / 1.9 = 4 / ·	70				
				12	S3	1.2 [60]		Mediur	n dense, dark	arevish bro	wn-dark d	rey and black, very seve	erely to	
				5		1.2 [00]			tely weathere		- 3	, , , , , , , , , , , , , , , , , , , ,	,	
				2	2		8.0		,					
				3			8.0							
				6	C4	1 6 1001								
				7	S4	1.6 [80]		Similar	to S3					
	40			8 ا	3		10.0							
	- 10 —	1		4			10.0	1					-	7////Y
				2										
				3	S5	0.8 [40]		Similar	to S3					
				1 11	ıl		12.0							
				60/0.4	S6	0.4 [100]	12.0 12.4	1	to S3, refusa	l on compet	tent BOCK	•		
				00/011			12.4	Sirrila	to oo, retuse	ii on compe	ichi Noch	\		
														$\rangle/\rangle\rangle$
														X //XX
												hered to fresh, moderat		
												grained, GNEISS. Zone		X///X//
F	- 15 —				C2	4.8 [100]					ng from 17	7.2' to 17.6'. Foliation is	steep to -	-\XX\\ <i>X</i>
								modera	ate, well-defin	ed.				
								RQD: 3	3.7 / 4.8 = 77	%				
							17.0							X///X//
							17.2 17.2	1						
90								Moder	ately hard to h	ard slightly	weathered	d to fresh, moderately fr	ractured to	
直					00	0.7.14.001						EISS. Intruded w/ PEGN		
>					C3	2.7 [100]						w, moderately well-define		VX////
핕									2.3 / 2.7 = 85		orrio oriano	w, moderatory went don	1100.	Y /// X //
:-	20						19.9							Y///Y/4_
2:2	- 20 —]							Rott	om of Evolo	ration @	19.9 ft (El. 198.7)		
0									Doll	.c.ii oi Lapid		10.0 11 (Li. 100.1)		
201														
20/														
6					1									
Ğ														
S.G														
ğ					1									
준														
BC					1									
EL	- 25 —													
ŽΙ	-													
씱														
527														
135					1									
Ö														
Ö					1									
BE														
ST	Sampler	Identifica	ntion			COHESIVE	SOILS		NON-COH	ESIVE SOILS	3	Soil Descriptions	Proportion	
띪	S		d Split Spo	on	Blows		Consisten	cv c	Blows/foot	Density		Capitalized Soil Name	Major Comp	onent
õ	SL		oon (O.D.:		0 -		Very Soft	<u>~</u>	0 - 4	Very Loose		Lower Case Adjective	35% - 50%	
Ā	T	Thin Wa		S 111)	2 -		Soft		5 - 10	Loose		Some	20% - 35%	
≥	ΰ		bed Piston		5 -		Medium S	tiff 4	1 - 24	Medium De		Little	10% - 20%	
Z.	0	Open En			9 -		Stiff		25 - 50	Dense		Trace	1% - 10%	
S:\GINTWPROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010 2:22:11 PM TB-06	Δ	Auger Fl			16 -		Verv Stiff		:5 - 50 > 50	Very Dense		11400	170 - 1070	,

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

Core Barrel

Not Recorded

NR

TB-06

31

> 60

Hard

Very Hard

New Hammshire

BRIDGE NO.

MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME **BEDFORD 13527**

DESCRIPTION US Route 3 Bridge Replacement **GROUNDWATER EQUIPMENT** SAMPLER **CASING CORE** DATE TIME DEPTH ELEV. BOTTOM BOTTOM TYPE: NW NX

BORING NO. **B17** SHEET NO. _ 1___ OF STA. 117+80 OFF. LT 260 US Route 3 BASELINE _ ELEVATION (ft) __ 229.6 8/5/10 / 8/5/10 START/END ____ DRILLER J. Woodward (NHDOT) 520

ENGLISH

Depth Dept		DATE	TIME	DEPTH (#)	(ft)	BOTTOM OF CASING		SIZE I.D.	(in):	1.375	3	1.875	INCDECTOR		Pogers
DEPIN STANDOL CHANCE BLOWS SAMPLES S		0/6/10	0.20 am	(ft)	· , ,				. ,						
Section Street Mode Section		6/6/10	6.30 am	21.2	206.4	30	30		, ,		-				
DEPTH LIDAMING SAMPLES SOUNDED PARTIES (1) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					$\overline{}$. ,		CME 45-C	C Track rig	EAST/NORTH (f	ft) <u>1036926/</u>	<u>161520</u>
The component account account of the component of the com			STRATUM	CHANGE (ft)	BLOWS		SAMPLER								1
1.8 227.8 8 1.1 1.5 5 5 5 5 5 5 5 5 5						NUMBER	RECOVERY	Y RANGE		FIELD	CLASSIF	FICATION	AND REMARKS	3	STRATUM SYMBOL
Dark prown. Throus TOP-SOIL Dark prown. Throught Top-Soil Dark prown. Th					0.5 ft	TTO III DE IT	(ft) [%]								01111202
1.8 227.8 1.7 2.0 1.7 2.0 1.7 2.0 1.7 2.0 1.7 2.0 1.7 2.0 1.7 2.0 1.7 2.0 1.7 2.0 1.7 2.0 1.7 2.0 1.7 2.0 1.7 2.0 1.7 2.0 1.7 2.0 2.		U	0.2	229.4	1			0.0						/	KI JE I
1.8 227.8 12 50						S1	1.1 [55]								A A
APPROXIMATE BEDROCK SURFACE: Moderately hard, severely to moderately severely medium grained, GNEISS, intruded wit coarse-grained GRANITE to 4.3. Joints/fractures query dose to closely spaced and ser shallow origing to near-horizontal. Few roots, intruded wit coarse-grained GRANITE in 1.6 of run. C2 4.8 [100] C2 4.8 [100] Moderately hard to hard, moderately severe to eligibility weathered. Slightly fractured to sound, grey and block, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal with exception of 55 fracture at 10.1 **Noticin sturfaces are discolored/stained. Foliation is moderately to shallow dipping, where discorrible. C3 4.8 [100] C3 4.8 [100] C3 4.8 [100] C3 4.8 [100] C4 4.8 [100] C5 4.7 [88] C6 4.0 [100] C7 4.7 [88] C8 4.7 [88] C9 5.7 [88] C9 5.7 [88] C9 6.7 [88] C9 6.7 [88] C9 6.8 [80] C9 7.8 [80] C9 7.8 [80] C9 8.8 [80] C9 8.8 [80] C9 8.8 [80] C9 9.8					1		[55]				n sand, occa	asional seve	rely weathered rock	k fragments	
Moderately hard, sewerely to moderately severely weathered, extremely to slightly fractured, grey and brownish grey, coarse-grained GRANITE to 4.3 Joints/fractures are very close to closely spaced and are shallow dipping to near-horizontal. Few roots, fractures grey and black, coarse-medium grained, CNEISS. Introde who coarse grained GRANITE to 4.3 Joints/fractures are very close to closely spaced and are shallow dipping to near-horizontal. Few roots, fractures grey and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal who expected to shallow dipping, where discontrol and expected to sound, grey and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal who expected to shallow dipping to near-horizontal. C2 4.8 [100] C3 4.8 [100] C4 4.8 [100] C5 4.7 [88] C6 4.7 [88] C6 4.7 [88] C7 4.7 [88] C8 4.8 [100] C9 4.8 [800] C9 4.8 [800]			1.8	227.8	50)			-\-GLAC			TE DEDDO			N/X
slightly fractured, grey and brownish grey, coarse-medium grained, GNEISS. 10 - 10 - 10 - 11 - 10 - 10 - 11 - 10 - 10 - 11 - 10 -								2.0		-A	PPROXIMA	TE BEDRO	CK SURFACE-		
slightly fractured, grey and brownish grey, coarse-medium grained, GNEISS. 10 - 10 - 10 - 11 - 10 - 10 - 11 - 10 - 10 - 11 - 10 -									Mada	-4-1-11				4	
The content of the															
to closely spaced and are shallow dipping to near-horizontal. Few roots, fleers present within fractures for first 1.6" of run. RQD: 2.17 4.8 = 44% Moderately hard to hard, moderately severe to slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal weapoint of 55 fracture at 0.1". Moderately hard to hard, slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal weapoint of 55 fracture at 0.1". Moderately hard to hard, slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained, GNEISS to 16.9". Overfles at 0.1" of 1.1" of 1.1							4 0 54001								
fibers present within fractures for first 1.6' of run. RQD. 2.1 / 4.8 = 44%. Color						C1	4.8 [100]								
RQD: 2.17.4.8 = 44% RQD: 2.17.4.8 = 44%		- 5 -													- }//////
Moderately hard to hard, moderately severe to slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to mear-horizontal will exception of 55° fracture at 10.1°. Most joint surfaces are discolored/stained. Foliation is moderately to shallow dipping, where discernible. RQD: 4.4 / 4.8 = 92% Moderately hard to hard, slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal plants are discolored/stained. Foliation is irregular, shallow to moderate, where discornible. RQD: 4.3 / 4.8 = 90% Moderately hard to hard, slightly weathered to fresh, slightly fractured, grey and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to 10° for the shallow															
Moderately hard to hard, moderately severe to slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to mear-horizontal will exception of 55° fracture at 10.1°. Most joint surfaces are discolored/stained. Foliation is moderately to shallow dipping, where discernible. RQD: 4.4 / 4.8 = 92% Moderately hard to hard, slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal plants are discolored/stained. Foliation is irregular, shallow to moderate, where discornible. RQD: 4.3 / 4.8 = 90% Moderately hard to hard, slightly weathered to fresh, slightly fractured, grey and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to near-horizontal will except to 10° for the shallow dipping to 10° for the shallow															
Moderately hard to hard, moderately severe to slightly weathered, slightly fractured to sound grey and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal w/ exception of 55' fracture at 10.1'. Most joint surfaces are discolored/stained. Foliation is moderately to shallow dipping, where discoemible. RQD: 4.4 / 4.8 = 92% Moderately hard to hard, slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained. CNEISS. Joints/fractures are closely spaced and shallow dipping in ear-horizontal. Most all joint surfaces are discolored/stained. Foliation is integular, shallow to moderate, where discoemible. RQD: 4.3 / 4.8 = 90% C4								6.8							
The fractured to sound, grey and black, coarse-medium grained, GNEISS Joints/fracture are dosely spaced and shallow dipping to near-horizontal Wexplored for Spirature at 10.11. Most joint surfaces are discolored/stained. Foliation is moderately to shallow dipping, where discornible. RQD: 4.4 / 4.8 = 92% Moderately hard to hard, slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained, GNEISS. Joints/fractures are dosely spaced and shallow dipping to near-horizontal. Most all joint surfaces are discorded/stained. Foliation is irregular, shallow to moderate, where discornible. RQD: 4.3 / 4.8 = 90% Moderately hard to hard, very slightly weathered to fresh, slightly fractured grey and black, coarse-medium grained, GNEISS. Joints/fractures are dosely spaced and shallow dipping to near-horizontal will exception of 55 fracture at 18.1. Zone of moderately severe weathering from 18.9 to end of rru. Joints/fractures are closely spaced and shallow dipping to near-horizontal will exception of 55 fracture at 18.1. Zone of moderately severe weathering from 18.1 to 18.5. RQD: 4.5 / 4.8 = 94% C5 4.7 [98] C6 4.0 [100] RQD: 4.0 / 4.8 = 83% CHESNE SOILS RQD: 4.0 / 4.8 = 83% CHESNE SOILS RQD: 4.0 / 4.8 = 83% CHESNE SOILS Sampler Identification S. Standard Spill Spoon SI. Large Spoon (O.D.= 3 in) T. Thin Wall Tube C9 4.0 [100] S. Standard Spill Spoon S. Standard Spill S								0.0							
The fractured to sound, grey and black, coarse-medium grained, GNEISS Joints/fracture are dosely spaced and shallow dipping to near-horizontal Wexplored for Spirature at 10.11. Most joint surfaces are discolored/stained. Foliation is moderately to shallow dipping, where discornible. RQD: 4.4 / 4.8 = 92% Moderately hard to hard, slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained, GNEISS. Joints/fractures are dosely spaced and shallow dipping to near-horizontal. Most all joint surfaces are discorded/stained. Foliation is irregular, shallow to moderate, where discornible. RQD: 4.3 / 4.8 = 90% Moderately hard to hard, very slightly weathered to fresh, slightly fractured grey and black, coarse-medium grained, GNEISS. Joints/fractures are dosely spaced and shallow dipping to near-horizontal will exception of 55 fracture at 18.1. Zone of moderately severe weathering from 18.9 to end of rru. Joints/fractures are closely spaced and shallow dipping to near-horizontal will exception of 55 fracture at 18.1. Zone of moderately severe weathering from 18.1 to 18.5. RQD: 4.5 / 4.8 = 94% C5 4.7 [98] C6 4.0 [100] RQD: 4.0 / 4.8 = 83% CHESNE SOILS RQD: 4.0 / 4.8 = 83% CHESNE SOILS RQD: 4.0 / 4.8 = 83% CHESNE SOILS Sampler Identification S. Standard Spill Spoon SI. Large Spoon (O.D.= 3 in) T. Thin Wall Tube C9 4.0 [100] S. Standard Spill Spoon S. Standard Spill S									NA	ataly band to !	and manda	ataly a arrar -	to olimbely	ad aliabet	X /// X //
This is the standard of the st															
## Exception of 55° fracture at 10.1°. Most joint surfaces are discolored/stained. Foliation is moderately to shallow dipping, where discornible. ## RQD: 4.4 / 4.8 = 92% Moderately hard to hard, slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal. Most all joint surfaces are discolored/stained. Foliation is irregular, shallow to moderate, where discornible. ## RQD: 4.4 / 4.8 100 RQD: 4.3 / 4.8 90% Moderately hard to hard, slightly weathered. Slightly fractured to sound, grey and black, coarse-medium grained, GNEISS to 16.9°. Overlies a coarse-grained PEGMATITE INTRUSION which exhends from 16.9° to end of run. Jointstractures are closely spaced and shallow dipping to near-horizontal we exception of 55° fracture at 18.1°. Zone of moderately severe weathering from 18.1° to 18.5°. ## RQD: 4.7 98 C5							407105								
Foliation is moderately to shallow dipping, where discernible. RQD: 4.4 / 4.8 = 92% Moderately hard to hard, slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal. Most all joint surfaces are discernible. RQD: 4.3 / 4.8 = 90% Moderately hard to hard, slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal. Most all joint surfaces are discernible. RQD: 4.3 / 4.8 = 90% Moderately hard to hard, very slightly weathered to fresh, slightly fractured, grey and black, coarse-medium grained, GNEISS to 16.9°. Overlies a coarse-grained PEGMATTIE introval which extends from 16.9° to end of run. Joints/fractures are closely spaced and shallow dipping to near-horizontal with exception of 55° fracture at 18.1°. Zone of moderately severe weathering from 18.1° to 18.5°. RQD: 4.5 / 4.8 = 94% C5 4.7 [98] FEGMATTIE from 24.9° to end of run. Joints are moderately close to closely spaced and shallow dipping to near-horizontal. RQD: 4.0 / 4.8 = 83% FEGMATTIE from 24.9° to end of run. Joints are moderately close to closely spaced and shallow dipping to near-horizontal. RQD: 4.0 / 4.8 = 83% FEGMATTIE from 24.9° to end of run. Joints are close to moderately close to closely spaced and shallow dipping to near-horizontal with exception of 25° fracture at 29.0° reaches and shallow dipping to near-horizontal with exception of 25° fracture at 29.0° reaches and shallow dipping to near-horizontal with exception of 25° fracture at 29.0° reaches and shallow dipping to near-horizontal with exception of 25° fracture at 29.0° reaches and shallow dipping to near-horizontal with exception of 25° fracture at 29.0° reaches and shallow dipping to near-horizontal with exception of 25° fracture at 29.0° reaches and shallow dipping to near-horizontal with exception of 25° fracture at 29.0° reaches and shallow dipping						C2	4.8 [100]								
RQD: 4.4 / 4.8 = 92%		- 10 -												-	-\//////
Moderately hard to hard, slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal. Most all joint surfaces are discorred/stained. Foliation is irregular, shallow to moderate, where discorrible. RQD: 4.3 / 4.8 = 90% C4 4.8 [100] C4 4.8 [100] C5 4.7 [98] C5 4.7 [98] C5 4.7 [98] C6 4.0 [100] C6 4.0 [100] C6 4.0 [100] C7 Indistribed Piston C8 Standard Split Spoon S1 Standard Split Spoon S1 Large Spoon (D.D = 3 in) T Thin Wall Tube T Thin Wall		-										- 1-1- 3,			
Moderately hard to hard, slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained. GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal. Most all joint surfaces are discorred/stained. Foliation is irregular, shallow to moderate, where discorrible. RQD: 4.3 [100] C4 4.8 [100] C4 4.8 [100] C5 4.7 [98] C5 4.7 [98] C5 4.7 [98] C5 4.7 [98] C6 4.0 [100] C6 4.0 [100] C7 4.3 [100] C8 4.3 [100] C9 4.5 [1.4 8 = 90% C6 4.0 [100] C7 4.5 [1.4 8 = 94% C6 4.0 [100] C8 5.5 Standard Split Spoon SI. Large Spoon (O.D. = 3 in) Tinhi Wall Tube C9 C															
Moderately hard to hard, slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained. GNEISS. Joints/fractures are closely spaced and shallow dipping to near-horizontal. Most all joint surfaces are discorrelisted. RQD: 4.3 / 4.8 = 90% C4 4.8 [100] C4 4.8 [100] C5 4.7 [38] C5 4.7 [38] C6 4.0 [100] C6 4.0 [100] C6 4.0 [100] C7 4.7 [38] C8 4.7 [38] C9 5.7 [38] C9 5.7 [38] C9 6.7 [38] C9 7 [38]								11.6							
and black, coarse-medium grained, GNEISS. Joints/fractures are closely spaced and shallow dipping to propose and giscernible. RQD: 4.3 / 4.8 = 90% C4								11.0							
and black, coarse-medium grained, GNEISS, Joints/fractures are closely spaced and shallow dipping to practices are discorrible. RQD: 4.3 / 4.8 = 90% C4 4.8 [100] C4 4.8 [100] C5 4.7 [98] C5 4.7 [98] C5 4.7 [98] C6 4.0 [100] C6 4.0 [100] C7 4.7 [98] C8 4.7 [98] C9 4.7 [98] C9 4.7 [98] C9 4.7 [98] C9 5.7 [21.2] C9 6.7 [21.2] C9 6.7 [21.2] C9 7 [21.2] C9 8 [21.2] C9 8 [21.2] C9 9 [21.2] C									Madan	-4-1	بالمطابعة المسعد		-1:		
Spaced and shallow dipping to near-horizontal. Most all joint surfaces are discorregistation. Foliation is irregular, shallow to moderate, where discorregistation. For the properties a coarse-grained PEGMATITE INTRUSION which extends from 16.9' to end of run. Joints/fractures are closely spaced and shallow dipping to near-horizontal will exception of 55' fracture at 18.1'. Zone of moderately severe weathering from 18.1' to 18.5'. RQD: 4.7 [98] Fig. 1.2 21.2 Eampler Identification S Standard Split Spoon SI. Large Spoon (O.D.= 3 in) T Thin Wall Tube S Standard Split Spoon SI. Large Spoon (O.D.= 3 in) T Thin Wall Tube C OHESIVE SOILS Blows/foot C Consistency C S Soil Standard Split Spoon SI. Large Spoon (O.D.= 3 in) T Thin Wall Tube C O Open End Rod O O pen End Rod O Open End Rod A Auger Flight S Soil Wery Stiff C S Soil Very Dense S Soil Descriptions Capitalized Soil Name Lower Case Adjective Some Some Some Some Some Some Some Som															
discord/stained. Foliation is irregular, shallow to moderate, where discording discording discording and shallow to moderate, where discording and shallow discording to the severe weathering from 18.1' to 18.5'. C4 4.8 [100] C4 4.8 [100] C4 4.8 [100] C5 4.7 [98] C5 4.7 [98] C5 4.7 [98] C6 4.0 [100] C6 4.0 [100] C6 4.0 [100] C6 4.0 [100] C7 4.8 [100] C8 4.7 [98] C9 5.7 [98] C9 6 4.0 [100] C9 7.7 [98] C9 8.7 [98] C9 9.7 [98] C9							4 0 54001								
discernible. RQD: 4.3 / 4.8 = 90% Moderately hard to hard, very slightly weathered to fresh, slightly fractured, grey and black, coarse-medium grained, GNEISS to 16.9'. Overlies a coarse-grained PEGMATITE INTRUSION which extends from 16.9' to end of run. Joints/fractures are closely spaced and shallow dipping to near-horizontal we exception of 55' fracture at 18.1'. Zone of moderately severe weathering from 18.1' to 18.5'. RQD: 4.5 / 4.8 = 94% C5 4.7 [98] Hard, very slightly weathered to fresh, sound to moderately fractured, grey, coarse-grained, GRANITIC INTRUSION. Transitions to a coarser PEGMATITE from 24.9' to end of run. Joints are moderately close to closely spaced and shallow dipping to near-horizontal. RQD: 4.0 / 4.8 = 83% C6 4.0 [100] Factor 4.0 / 4.8 = 83% C6 4.0 [100] Factor 4.0 / 4.8 = 83% C7 4.7 [98] Factor 4.0 / 4.8 = 83% C8 4.0 [100] Factor 4.0 / 4.8 = 83% C8 5 Standard Split Spoon On the Person Standard Split Spoon Spoon (D.D.=3 in) Split Spoon Span Span Split Spoon Span Split Spoon Span Split Spoon Span Split Spoon Span Span Span Span Span Span Sp						C3	4.8 [100]								
Moderately hard to hard, very slightly weathered to fresh, slightly fractured, grey and black, coarse-medium grained, GNEISS to 16.9'. Overlies a coarse-grained PEGMATITE INTRUSION which extends from 16.9' to end of run. Joints/fractures are closely spaced and shallow dipping to near-horizontal we exception of 55' fracture at 18.1'. Zone of moderately severe weathering from 18.1' to 18.5'. C5 4.7 [98] Hard, very slightly weathered to fresh, sound to moderately fractured, grey, coarse-grained, GRAINTIC INTRUSION. Transitions to a coarser PEGMATITE from 24 9' to end of run. Joints are moderately close to closely spaced and shallow dipping to near-horizontal. RQD: 4.7 [98] Hard, very slightly weathered to fresh, sound to moderately fractured, grey, coarse-grained, GRAINTIC INTRUSION. Transitions to a coarser PEGMATITE from 24 9' to end of run. Joints are moderately close to closely spaced and shallow dipping to near-horizontal. RQD: 4.0 4.0 8 9% Sampler Identification Cohesive Solls Sandard Split Spoon St. Large Spoon (D.D=3 in) Large Spoon (D.D=3 in) CHESIVE SOILS NON-COHESIVE SOILS Soil Descriptions Proportion Major Component St. Large Spoon (D.D=3 in) COHESIVE SOILS Soil Soil Descriptions Some Proportion Major Component St. Large Spoon (D.D=3 in) 1 Thin Wall Tube 2 4 Soft 5 - 10 Loose Some Lover Case Adjective 35% - 50% NON-COHESIVE SOILS Soil Descriptions Some Lover Case Adjective 35% - 50% NON-COHESIVE SOILS Soil Descriptions Some Trace 11% - 10% - 20% Lover Case Adjective 35% - 50% A Auger Flight 16 - 30 Very Stiff > 50 Very Dense		15									onacion io ii	rogalar, orla	movi to inicaciato, in		
Moderately hard to hard, very slightly weathered to fresh, slightly fractured, grey and black, coarse-medium grained, GNEISS to 16.9°. Overflies a coarse-grained PEGMATITE INTRUSION which extends from 16.9° to end of run. Joints/fractures are closely spaced and shallow dipping to near-horizontal we exception of 55° fracture at 18.1°. Zone of moderately severe weathering from 18.1° to 18.5°. RQD: 4.5 / 4.8 = 94% C5 4.7 [98] C6 4.0 [100] C6 4.0 [100] C7 4.7 [98] C8 4.7 [98] C9		_ 15 _							RQD: 4	4.3 / 4.8 = 90	%				X //XX
Moderately hard to hard, very slightly weathered to fresh, slightly fractured, grey and black, coarse-medium grained, GNEISS to 16.9°. Overflies a coarse-grained PEGMATITE INTRUSION which extends from 16.9° to end of run. Joints/fractures are closely spaced and shallow dipping to near-horizontal we exception of 55° fracture at 18.1°. Zone of moderately severe weathering from 18.1° to 18.5°. RQD: 4.5 / 4.8 = 94% C5 4.7 [98] C6 4.0 [100] C6 4.0 [100] C7 4.7 [98] C8 4.7 [98] C9															
Moderately hard to hard, very slightly weathered to fresh, slightly fractured, grey and black, coarse-medium grained, GNEISS to 16.9°. Overfles a coarse-grained PEGMATTIE INTRUSION which extends from 16.9° to end of run. Joints/fractures are closely spaced and shallow dipping to near-horizontal will exception of 55° fracture at 18.1°. Zone of moderately severe weathering from 18.1° to 18.5°. RQD: 4.5 / 4.8 = 94% C5 4.7 [98] C5 4.7 [98] C6 4.0 [100] C6 4.0 [100] C7 4.7 [98] C8 4.0 [100] C9 4.0 [4.0 4.8 83% C9 4.0 [100] C9 5 Sampler Identification C9 5 Standard Split Spoon S1 Large Spoon (O.D. = 3 in) T Thin Wall Tube C9 5 Standard Split Spoon S1 Large Spoon (O.D. = 3 in) T Thin Wall Tube C9 6 Coperation of the standard split Spoon S2 Large Spoon (O.D. = 3 in) T Thin Wall Tube C9 7 Stuff Spoon C9 8 Medium Sliff C9 9 - 15 Stiff C9 9 Stuff Sightly weathered to fresh, sound to moderately fractured, grey, coarse-grained, GRANITIC INTRUSION. Transitions to a coarser PEGMATITE from 24.9° to end of run. Joints are moderately close to closely spaced and shallow dipping to near-horizontal. RQD: 4.0 [4.0 [4.0 [4.8 = 83%] C9 10 Cohesive Soils C9 11 Spoon S1 Large Spoon (O.D. = 3 in) T Thin Wall Tube C9 12 Cohesive Soils C9 13 Cohesive Soils C9 13 Cohesive Soils C9 13 Cohesive Soils C9 13 Cohesive Soils C9 14 Very Lose Some C9 20% - 35% Some C9 20% C9 20								16.4							
General Personal Pers								10.4							
C4 4.8 100									Modera	ately hard to h	ard, very sli	ightly weathe	ered to fresh, slight	ly fractured,	
C4 4.8 100	90-														
Page 1 20 - 20 - 21.2 Continue Continue	믵					0.4	4 0 [400]								
Hard, very slightly weathered to fresh, sound to moderately fractured, grey, coarse-grained, GRANITIC INTRUSION. Transitions to a coarser PEGMATITE from 24.9' to end of run. Joints are moderately close to closely spaced and shallow dipping to near-horizontal. RQD: 4.0 / 4.8 = 83% Hard, fresh, moderately fractured to sound, grey-brownish grey, coarse-grained, PEGMATITE. Joints are close to moderately closely spaced and shallow dipping to near horizontal w/ exception of 25° fracture at 29.0'. RQD: 3.6 / 4.0 = 90% Sampler Identification COHESIVE SOILS Soil Descriptions Component Capitalized Soil Name Capital	Β					C4	4.8 [100]		of run.	Joints/fractur	es are close	ely spaced a	nd shallow dipping	to	
Hard, very slightly weathered to fresh, sound to moderately fractured, grey, coarse-grained, GRANITIC INTRUSION. Transitions to a coarser PEGMATITE from 24.9' to end of run. Joints are moderately close to closely spaced and shallow dipping to near-horizontal. RQD: 4.0 / 4.8 = 83% Hard, fresh, moderately fractured to sound, grey-brownish grey, coarse-grained, PEGMATITE. Joints are close to moderately closely spaced and shallow dipping to near horizontal w/ exception of 25° fracture at 29.0'. RQD: 3.6 / 4.0 = 90% Sampler Identification COHESIVE SOILS Soil Descriptions Component Capitalized Soil Name Capital	5.7												at 18.1°. Zone of m	oderately	$\rangle \rangle \rangle \rangle \rangle \rangle \rangle \rangle \langle \gamma \rangle \rangle \langle \gamma $
Hard, very slightly weathered to fresh, sound to moderately fractured, grey, coarse-grained, GRANITIC INTRUSION. Transitions to a coarser PEGMATITE from 24.9' to end of run. Joints are moderately close to closely spaced and shallow dipping to near-horizontal. RQD: 4.0 / 4.8 = 83% Hard, fresh, moderately fractured to sound, grey-brownish grey, coarse-grained, PEGMATITE. Joints are close to moderately closely spaced and shallow dipping to near horizontal w/ exception of 25° fracture at 29.0'. RQD: 3.6 / 4.0 = 90% Sampler Identification COHESIVE SOILS Soil Descriptions Component Capitalized Soil Name Capital	22	- 20 −	1									10.0		-	- {\/,{\\
									ו/עט. י	T.J / +.U - 94	/U				
	201														\
	/20/														
	9														
	GP,														DX
	GS.					CF	4 7 [00]		coarse	-grained, GRA	ANITIC INTI	RUSION. Tr	ansitions to a coars	ser .	Y//
	ž					U5	4.7 [98]							ose to closely	
	306											ear-norizont	aı.		
	E3	_ 25 _							KQD: 4	+.0 / 4.8 = 83	70			-	_{\\\\\
	5														
	Ä							26.0							\mathbb{K}/\mathbb{K}
	3527														
	713								,,		tale of				
)RE														
	DFC					C6	4.0 [100]								Y//
	IBE											ZUNIAN W/ EX	Depulori di 25 Tracti	ure at ∠9.0 .	
	ίS	Sampler	Identifica	ation	.1		COHESIVI	E SOILS	1,00.			3 9	oil Descriptions	Proportion	*/*////
	Æ				on	Blows			cv F						onent
	RO														
	ΔV	Т			,	2 -				5 - 10					
	Ę	_			1	1						I			
	9											I	race	1% - 10%	, D
	9	A				16 -		Very Stiff Hard				e			

WOR - Weight of Rod

WOH - Weight of Hammer

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

60 -

65

TB-06



BORING NO. **B17** SHEET NO. 2 OF. STA. <u>117+80</u> OFF. <u>LT 260</u> US Route 3 BASELINE _

MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME **BEDFORD 13527** BRIDGE NO. US Route 3 Bridge Replacement DESCRIPTION 229.6 ELEVATION (ft) STRATUM CHANGE (ft) BLOWS PER 0.5 ft SAMPLER RECOVERY (ft) [%] DEPTH RANGE (ft) DEPTH (ft) SAMPLE NUMBER STRATUM SYMBOL FIELD CLASSIFICATION AND REMARKS DEPTH ELEVATION 30.0 30 Bottom of Exploration @ 30.0 ft (El. 199.6) 35 - 40 45 50 S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010 2:22:13 PM TB-06 55

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

New Hammshire

PROJECT NAME **BEDFORD 13527** N/A BRIDGE NO. US Route 3 Bridge Replacement

DESCRIPTION **GROUNDWATER EQUIPMENT** SAMPLER **CASING** CORE DATE TIME DEPTH ELEV. BOTTOM BOTTOM TYPE NW NX

BORING NO. **B18** SHEET NO. . OF STA. 118+20 OFF. LT 165 US Route 3 BASELINE _ ELEVATION (ft) _ 235.5 8/5/10 / 8/6/10 START/END ___ DRILLER J. Pierce (NHDOT) 19

	DATE	TIME	DEPTH	ELEV.	BOTTOM	воттом _	TYPE:		S	NW	NX	DRILLER		
	DAIL	'''VIL	(ft)	(ft)	OF CASING	OF HOLE	SIZE I.D.	(in):	1.375	3	1.875	INSPECTOR _	Doug Rogers	S
	8/6/10	8:00 am	11.6	223.9	12.8	12.8	HAMMER	R WT. (lb):	140	DRIL	L RIG	CLASSIFIER _	DRR	
	8/6/10	12:30 pm	18.8	216.7	31.3	31.3	HAMMER	R FALL (in):	30					_
							HAMMER	TYPE:	Automatic	CIVIE 45-C	C Track rig	EAST/NORTH (ft)	1036949/1614	+ 1
	DEPTH	STRATUM	CHANGE (ft)		SAMPLE	SAMPLER	DEPTH				-10 4 -10 4 1	AND DEMARKS	STF	RΑ
	(ft)	DEPTH	ELEVATION	PER 0.5 ft	NUMBER	RECOVERY (ft) [%]	RANGE (ft)		FIELL	CLASSIF	-ICATION	AND REMARKS	SY	M
	- 0 -		005.0	1	+	(17[74]	0.0	Dork b	rown. fibrous	TODCOIL				<u>.</u>
		0.4	235.2	, ₂							ome silt to '	"silty", trace fine grave		\bar{z}
		1.2	234.3	7	S1	1.2 [60]			-medium san				i, trace	÷
				' 8	3		2.0	COCHIOC	mediam san	a, occasione	ar root, riber	CODOCIL		#
				15			2.0	Vallan	:-b			NE CAND some model		d
				20	S2	1.0 [83]			little gravel, lit			NE SAND, some medi GLACIAL TILL-	um sanu,	Ţ
		3.2	232.3	40/0.2			3.2	SUITIE-						 7
									-A	PPROXIMA	TE BEDRO	CK SURFACE-		K
								N 4l	-4-1-1		-4-1-411-1		-4-4	2
	- 5 -											ntly weathered, modera -grained, GRANITIC	ately	/
					C1	4.8 [100]						mely fractured from st	art of run	\nearrow
						4.0 [100]						sely spaced and are sl		/
												r cracks in core surfac		Σ
									it at 5.0' and 6					/
									1.5 / 4.8 = 31					Ś
					-		8.0							//
													N N	K
								Hard (cliabtly woath	orod cliabtly	to moderat	ely fractured, grey and	1 vollowich	2
												ION. Severely weathe		/
	─ 10 ─				C2	4.7 [98]						'. Joints/fractures are \		\geq
					62	4.7 [90]						ar horizontal. Joint sur		//
									to very rough.		FI 5			Σ
								RQĎ:	2.7 / 4.8 = 56	%				7
														S
					-		12.8						¥//	//
													N N	K
								Hard to	o moderately	hard slightly	, weathered	, moderately fractured	Y /	2
												arse-grained, GRANIT		Z
	- 15 −				СЗ	4.8 [104]						d extreme fracturing fr		S
	.0				03	4.0 [104]						osely spaced and shal		/
											of near-verti	cal fracture at 14.6'.	•	Ś
								RQD:	1.1 / 4.6 = 24	%				//
							47.4							K
							17.4 17.4						Y /	2
9													X	Z
Щ								Hard v	very slightly w	eathered to	fresh slight	tly fractured to sound,	grey and	À
Δ												NTRUSION. Very sev		7
15					C4	4.8 [100]		weath	ered zone fror	n 19.8' to 19	9.9'. Joints a	are close to moderately	/ closely	S
2:22:15 PM TB-06	− 20 −				04	4.0 [100]						tal. Incomplete crack in		4
0									e extending fr			•		Ś
Ò								RQD:	4.7 / 4.8 = 98	%			¥//	//
9/20/20	1				1								N.	\$
6					 		22.2						<i>\(\)</i>	?
GP,	1				1								N. C.	/
38.	1				1								<i>≫</i> .	X
N⊠	1				1							d, grey and brownish o		/
δÃ	1				C5	4 2 1001						pints are moderately cl		Ś
E3E	- 25 -				C5	4.3 [90]						horizontal. Approximat	ely 0.5' of	//
5	25								as left in hole		retrieve.		N N	K
8								RQD:	4.2 / 4.8 = 88	%			\\/	2
527	1				1								 	/
/136	1				<u> </u>		27.0 27.0						<i>≫.</i>	Ž
Ã							21.0							//
Ğ												d, grey and brownish o		S
3EC	1				1							pints are moderately cl		/
S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ	Complet	ldortifi	l	1	+	COHESIVE	- SON 8	space(alpping to n ESIVE SOILS		tal. Moderately severel		Δ
Ē	Sampler S	Identifica	<u>ation</u> d Split Spo	on	Blows		z SOILS Consisten	_{CV}	Blows/foot	Density	1 -	oil Descriptions capitalized Soil Name	Proportion Major Componer	nŧ
307	SL		poon (O.D.		0 -		Very Soft	<u>→</u> ;	0 - 4	Very Loose		ower Case Adjective	35% - 50%	11
γPF	T	Thin Wa		,	2 -		Soft		5 - 10	Loose		ome	20% - 35%	
Ę	U		bed Pistor	ı	5 -		Medium S	tiff	11 - 24	Medium De	I	ittle	10% - 20%	
9	0	Open Er			9 -		Stiff	- 1	25 - 50	Dense	I	race	1% - 10%	
		Auger Fl			16 -		Very Stiff		> 50	Very Dense	e			_
9	C	Core Ra	rrei		31 -	60 1	Hard		NOR - Weight	Of FOG	1	= 1011		

31

> 60

Hard

Very Hard

TB-06

NR

Core Barrel

Not Recorded

0 Very Loose 5 10 Loose 11 -Medium Dense 24 25 50 Dense Very Dense WOR - Weight of Rod WOH - Weight of Hammer

ENGLISH

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION



BORING NO. B18

SHEET NO. 2 OF 2
STA. 118+20 OFF. LT 165

BASELINE US Route 3

ELEVATION (ft) 235.5

PROJECT NAME BEDFORD 13527 BRIDGE NO. N/A BASELINE DESCRIPTION US Route 3 Bridge Replacement ELEVATION

	RIPTIO				e Replac			5.5
DEPTH (ft)		CHANGE (ft)	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)	FIELD CLASSIFICATION AND REMARKS	STRATU SYMBO
30 -				C6	4.8 [112]	31.3 31.3	weathered joint surface at 27.0', extending 1" beyond the joint. Noted sudden, temporary drilling fluid loss from 27.0' to approximately 28.5'. Additional 0.5' of core was picked up from C5. ROD: 4 2 / 4 3 = 98%	
35 —				C7	4.5 [94]		Hard, fresh to very slightly weathered, sound to slightly fractured, grey and brownish grey, coarse-grained, GRANITIC INTRUSION. Zone of severe weathering and extreme fracturing from 33.9' to 34.1'. Joints are moderately close to closely spaced and shallow dipping to near-horizontal. Approximately 0.3' of core was left in hole. Unable to retrieve. RQD: 4.3 / 4.8 = 90%	
						36.1	Bottom of Exploration @ 36.1 ft (El. 199.4)	
40 —								
45 —								
50 —								
55 —								
60 —								
65 —								

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION



MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME BEDFORD 13527

BRIDGE NO.

US Route 3 Bridge Replacement DESCRIPTION **GROUNDWATER EQUIPMENT** SAMPLER **CASING** CORE DEDTH FLEV ROTTOM ROTTOM NX 1.875 1.375 3 (lb): 140 DRILL RIG LL (in): 30 CME 45-C Track rig PE: Automatic

BORING NO. **B19** SHEET NO. . OF STA. <u>118+50</u> OFF. LT 80 US Route 3 BASELINE _ 239.1 ELEVATION (ft) 8/4/10 / 8/5/10 START/END _ DRILLER ___ J. Pierce (NHDOT) **Doug Rogers** INSPECTOR CLASSIFIER DRR 1036963/161330 EAST/NORTH (ft)

STRATUM

SYMBOL

	DATE	TIME	DEPTH	ELEV.	воттом	воттом	TYPE:		S	NW	NX	: ::===: :	J. Pierce (N
			(ft)	(ft)	OF CASING		SIZE I.D. HAMMER		1.375 140	3	1.875	INSPECTOR	Doug
	8/5/10	8:00 am	11.5	227.6	18.4	18.4		FALL (in):	30	DRILI		CLASSIFIER	DI
							HAMMER	TYPE:	Automatic	CIME 45-C	Track rig	EAST/NORTH (ft) <u>10369</u> 6
	DEPTH (ft)		CHANGE (ft) ELEVATION	PER	SAMPLE NUMBER	SAMPLER RECOVER' (ft) [%]			FIELD	CLASSIF	CATION	AND REMARKS	3
	- O -	0.3	238.8	WOH 2 3	S1	0.9 [45]	0.0	Loose,		sh brown to y	ellowish bro	S TOPSOIL own, FINE SAND, so n sand, occasional to	
		2.0	237.1 235.5	11 20 24 50	S2	1.3 [65]	2.0	gravel,	little medium ered rock frag	sand, little-t ment	race coarse -GLACIAL	ome silt to "silty", so e sand, occasional s	
	- 5 -				C1	4.3 [90]	8.8	extrem coarse Entire joint su to near Foliatio	m to moderate ely to modera -grained, GN core surface urfaces. Joints	e hardness, ately fracture EISS. Intrud is heavily sta s/fractures a dinor crackin ernible.	severely to red, yellowish ed w/ coarseined. Roots	moderately severely brown-greyish bro e-grained GRANITI fibers occasionally e to closely spaced g of core surface is	wn to grey, E throughout y present on and are stee
	- 10 -				C2	4.8 [100]	13.6	to extre SCHIS close t High-a fractur heavily	emely fracture T w/ intrusion o very closely ngle fractures es between 1	ed, brownish ns of coarse spaced with are present 2.7' and 13. casional pittir	grey to grey grained GR the majorit t at 9.2' as v 4'. All joint s	severely weathered y, medium-grained, ANITE. Joints/frac y being shallow dip vell as multiple high surfaces are moder acking of core surfa	, GNEISSIC tures are ping. n-angle ately to
B-06	— 15 —				C3	4.8 [100]	13.6	fractur weathed close to 85-90° 45-50° Foliatio	ed, grey, med ering and extro o very closely at 16.4' and	lium-grained eme fracturi spaced and 17.1', 70-75 8' and 15.0'. e to steep, w	, GNEISSIC ng from 17.0 steeply to r ° at 13.7', 1 All joint sur	d, moderately to sli C SCHIST. Zone of 0' to 17.4'. Joints/fr noderately dipping. 4.0' and 15.7', 65° faces are discolore nible.	severe ractures are Fractures of at 16.1' and
GPJ 9/20/2010 2:22:17 PM TB-06	- 20 -				C4	4.8 [100]	18.4	modera becom Multipl surface Foliatio	ately fractured es schistose. e high angle/i	d, grey, coar Joints/fractonear vertical ated. Kaoliniz	se-medium ures are ver fractures fr	rerely weathered, e.grained, GNEISS. y close to closely sporn 18.4' to 22.4'. None of the feldspar is	Occasionally paced. Many joint
S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/20	- 25 -				C5	4.3 [90]	23.2	slightly Intrude weathe very cleare sha well-de to retrie	r fractured, gred by coarse-gered and extreosely to close allow dipping efined within t	ey and black grained PEG emely fractur ly spaced. F to near-horiz he schist. Ap	s, medium-g MATITE fro ed within zo ractures of zontal. Folial	ntly weathered, mor rained, GNEISSIC m 23.2' to 25.8'. So one from 23.2' to 23 70° at 25.8' and 23 tion is moderately v v 0.5' of core left in	SCHIŠT. everely 3.8'. Joints ar 3.8'. All others well to
3EDF							28.0	5 .			D		
:TS/E	Sampler	Identifica	l			COHESIV	E SOILS	<u>Descri</u>	<u>ption Continu</u> NON-COH	<i>es on Next I</i> ESIVE SOILS		oil Descriptions	Proportio
SJEC	S	Standard	d Split Spo		Blows	<u>foot</u>	Consisten	су Е	Blows/foot	Density	C	apitalized Soil Name	Major Co
\PR0	SL T	Large Sp Thin Wa	ooon (O.D. III Tube	.= 3 in)	0 - 2 -		Very Soft Soft		0 - 4 5 - 10	Very Loose Loose		ower Case Adjective ome	35% - 5 20% - 3
Ě	ΰ		iii Tube bed Pistor	1	5 -		Medium S	tiff /	11 - 24	Medium De	- I	ittle	10% - 3
9	0	Open Er			9 -		Stiff		25 - 50	Dense	- I	race	1% - 1
9	A	Auger Fl			16 -		Very Stiff Hard		> 50 VOR - Weight	of Rod		E1:0	

> 60

Very Hard

Hard

90-

Core Barrel

Not Recorded

Description	Continues or	า Next	Page

WOH - Weight of Hammer

NON-COF	HESIVE SOILS	Soil Descriptions	<u>Proportion</u>
Blows/foot	<u>Density</u>	Capitalized Soil Name	Major Component
0 - 4	Very Loose	Lower Case Adjective	35% - 50%
5 - 10	Loose	Some	20% - 35%
11 - 24	Medium Dense	Little	10% - 20%
25 - 50	Dense	Trace	1% - 10%
> 50	Very Dense		
WOR - Weight	t of Rod	ENGL	ISH

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

TB-06

65



BORING NO.	. B19
SHEET NO	2 OF 2
STA. 118+50	OFF. LT 80
BASELINE	US Route 3
ELEVATION (III)	220.4

PROJECT NAME **BEDFORD** 13527 BRIDGE NO. US Route 3 Bridge Replacement DESCRIPTION ELEVATION (ft) STRATUM CHANGE (ft) BLOWS SAMPLER DEPTH STRATUM SYMBOL DEPTH SAMPLE PER 0.5 ft RECOVER (ft) [%] FIELD CLASSIFICATION AND REMARKS NUMBER ELEVATION DEPTH Moderately hard to hard, slightly weathered, slightly to moderately fractured, grey and black, coarse-medium grained, GNEISS. Intruded w/ 30 coarse-grained PEGMATITE from 31.4' to end of run. Gneiss zone C6 4.8 [112] occasionally becomes schistose. Joints/fractures are closely spaced. Severely weathered and extremely fractured zone from 30.8' to 31.4'. Fractures of 70-75° at 28.6' and 30.7'. 32.3 32.3 RQD: 3.7 / 4.3 = 86% Moderately hard-hard, moderately to moderately severely weathered, grey, extremely to moderately fractured, medium-grained, GNEISSIC SCHIST. Intruded w/ PEGMATITE from 32.3' to 32.9'. Multiple high-angle fractures C7 3.5 [100] throughout the run. Joints/fractures are very closely spaced. Core barrel jammed at 35.8', run terminated. 35 RQD: 0.0 / 3.5 = 0% Bottom of Exploration @ 35.8 ft (El. 203.3) 40 45 50 S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010 2:22:17 PM TB-06 55 60

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

Core Barrel

Not Recorded

С

NR

TB-06

31

> 60

Very Hard

Hard

WOR - Weight of Rod

WOH - Weight of Hammer



MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME **BEDFORD** 13527 BRIDGE NO.

US Route 3 Bridge Replacement DESCRIPTION CORE **GROUNDWATER EQUIPMENT** SAMPLER **CASING** TYPE NX BOTTOM BOTTOM OF CASING OF HOLE DEPTH ELEV. DATE TIME SIZE I.D. (in): 1.875 1.375 (ft) (ft) 3 HAMMER WT. (lb): 140 8/31/10 12:00 pm 225.0 35.3 18.8 31.0 **DRILL RIG**

BORING NO. **B20** SHEET NO. OF STA. 118+81 OFF. RT 51 US Route 3 BASELINE _ ELEVATION (ft) _ 243.8 START/END 8/30/10 / 8/31/10 DRILLER J. Pierce (NHDOT) Doug Rogers INSPECTOR DRR **CLASSIFIER** 1196

ENGLISH

	12.00 pm		225.0	31.0	35.3		R FALL (in):	30	DRILL RIG	CLASS	SIFIER		JKK	
8/31/10 9/1/10	12:30 pm 10:00 am		224.6 221.5	31.0 None	35.3 35.3	HAMMER		Automatic	CME 45-C Track	<u>∢rig</u> EAST/N	IORTH (ft)	1036	970/16	1196
į,		CHANGE (ft)	BLOWS		SAMPLER				L	l .				
DEPTH (ft)	DEPTH	ELEVATION	PER	SAMPLE NUMBER	RECOVER'	Y RANGE		FIELD	CLASSIFICAT	ION AND RE	MARKS		S	STRATI SYMB(
- o	DEPIR	ELEVATION	0.5 ft		(ft) [%]	(ft)								~~~
•	0.3	243.5	1			0.0	→ <u>Dark</u> b	rown, fibrous	TOPSOIL				\	\Longrightarrow
			8	S1	0.9 [45]				and dark yellowish			little silt	, 🖔	XXX
			37		' '		trace o	coarse-mediur	n sand, few fibers,	occasional woo			X	\ggg
	2.0	241.8	11 22			2.0			nered cobble from 1					$\stackrel{\times\!\!\times\!\!\!\times}{\sim}$
			14	S2	0.6 [60]				d greyish brown, FII edium sand, occasi				ذِ إ	* 1
	3.0	240.8	26/0			3.0	fragme		-GLACIAL		realitered to	CK	/k	777
							magnic		PPROXIMATE BEI		ACF-		→	X
							Moder		nard, severely to mo			nely to	K	// <i>)</i>
_									d, grey-black and da					X
5 –				C1	4.0 [83]				ctures are very close				0°	'/ <i>/</i> /
					' '				iding from 6.4' to 7.					//
									ained/discolored. Sated minor crack in				\triangleright	Y/>
							irregul	er mostly ste	ep, where discernib	ole Suidden tot:	al loss of dril	lina flui	и 🖔	$\!$
						7.8			inder of boring.	RQD: 2.9 / 4		iii ig iiai	Ĭ	$\rangle\rangle\rangle$
						7.8			.				<u> </u>	$\langle\!\langle\!\rangle$
													8	\gg
							Hard,	slightly to very	slightly weathered	, slightly to mod	derately fract	ured, g	rey 🏌	
. 10									edium grained, GN				A II	X
10 —				C2	4.8 [100]				f 70-75° at 7.8', 75 lipping. Joint surfac					
									efined and steep.	es are an stairt	<i>3</i> 0 up 10 9.9	. FUllati	OII	>>>
								2.8 / 4.8 = 58					K	<i>[]]]</i>
									,,					X
						12.6 12.6							₽	<i>//)</i>
						12.0	Hord :	on coliabtly w	roothorod to frooh	moderately free	tured to sou	nd aro	, [X
									eathered to fresh, r rained, GNEISS. Jo					$/\!/\!>$
									ctures of 85° at 12.8					$\langle\!\langle\!\rangle$
45				C3	4.9 [107]				rtially slickensided					\gg
15 —					1.0[107]				acking of core surf				7	\langle / \rangle
									o moderate. Additio	onal 0.25' of cor	re picked up	from		\gg
								us runs.	0/				K	4//
						17.2	RQD:	3.6 / 4.6 = 78	%					>>>
						17.2							K	
														\gg
							Hard s	slightly to very	slightly weathered	slightly fractur	red arev and	l black	Ì	
									EISS. Joints/fractur					X
20				C4	4.8 [100]				nor cracking of core		lent. Foliation	n is	\triangleright	///
20 —									nd moderately well-	-defined.				\ll
							KQD:	4.5 / 4.8 = 94	%				\triangleright	// <i>)</i>
						1								\ll
						22.0								<i>Y)</i> >
													K	$\langle\!\langle\!\rangle$
													\$	\gg
						1			eathered, moderate				rk 🏌	<i>{//</i>
				C5	4.6 [96]				d, GNEISS. Joints/f				_	\gg
2F				55	7.0 [30]				ctures of 50-60° at a partially slickensided			surtac	e K	<i>[]].</i>
25 —								2 is smooth, p 3.9 / 4.8 = 81		a anu nas nace	a or pyrite.			\gg
							i (QD.	5.57 4.0 - 61	, o				K	
						26.0							[X
						26.8 26.8							8	[]]
														\ll
							Hard.	very slightly w	eathered, slightly fr	actured, grev-d	dark grev and	d black.	\triangleright	Y/)
									EISS. Joints/fractur				K	$\langle\!\langle\!\rangle$
ampler	Identifica	ation			COHESIV	E SOILS		•	ESIVE SOILS	Soil Descript	•	Propor		7777
		d Split Spo	on	Blows		Consisten	cv I	Blows/foot	Density	Capitalized S			<u>tion</u> Compon	nent
		oon (O.D.		0 -		Very Soft	→ '	0 - 4	Very Loose	Lower Case		35% -		
T	Thin Wa	ıll Tube	,	2 -	4	Soft		5 - 10	Loose	Some	-	20% -	35%	
		bed Piston	I	5 -		Medium S		11 - 24	Medium Dense	Little		10% -		
	Open En			9 -		Stiff		25 - 50 > 50	Dense Vary Danse	Trace		1% -	10%	
	Auger Fl			16 -		Very Stiff Hard		> 50 NOR - Weight	Very Dense					

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

TB-06

65



BORING NO. **B20** SHEET NO. OF 118+81_OFF._ RT 51 STA. _ US Route 3

PROJECT NAME **BEDFORD** 13527 BRIDGE NO. BASELINE US Route 3 Bridge Replacement **DESCRIPTION** 243.8 **ELEVATION (ft)** BLOWS PER 0.5 ft SAMPLER RECOVERY (ft) [%] DEPTH RANGE (ft) STRATUM CHANGE (ft) SAMPLE NUMBER STRATUM SYMBOL DEPTH FIELD CLASSIFICATION AND REMARKS ELEVATION DEPTH 4.5 [105] dipping w/ exception of 70° fracture at 30.5'. Foliation is steep and well-defined. 30 RQD: 4.0 / 4.3 = 93% 31.1 31.1 Hard, fresh, sound, grey and dark grey, coarse-grained, GNEISS. Joints are tight, shallow dipping. Foliation is steep and well-defined. Approximately 0.7' C7 4.2 [86] of core left in hole. RQD: 3.9 / 4.9 = 80% 35 36.0 Bottom of Exploration @ 36.0 ft (El. 207.8) 40 45 50 S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010 2:22:20 PM TB-06 55 60

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

31

> 60

С

NR

TB-06

Core Barrel

Not Recorded

Very Hard

Hard

WOR - Weight of Rod

WOH - Weight of Hammer

ENGLISH



MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME **BEDFORD 13527**

N/A BRIDGE NO.

DESCRIPTION US Route 3 Bridge Replacement **GROUNDWATER EQUIPMENT** SAMPLER **CASING CORE** TYPE: NW NX DEPTH (ft) ELEV. BOTTOM BOTTOM OF CASING OF HOLE DATE TIME

BORING NO. **B21** SHEET NO. ___1__ OF _ STA. <u>119+00</u> OFF. <u>LT 180</u> BASELINE US Route 3 ELEVATION (ft) __ 232.7 START/END ___ 8/3/10 / 8/3/10 DRILLER J. Pierce (NHDOT)

DATE	TIME	(ft)	(ft)	OF CASING	OF HOLE	SIZE I.D.	. ,	1.375	3	1.875	INSPECTOR _	J. Piero	e
8/3/10	2:30 pm	Dry		5.7	5.7	HAMMER		140	DRILI	<u>RIG</u>	CLASSIFIER _	DRR	
					_	HAMMER	R FALL (in):	30 Automatic	CME 45-C	Track rig	EAST/NORTH (ft)	1037030/1	61420
DEPTH .	STRATUM	CHANGE (ft)	BLOWS	I SAIVIPLE	SAMPLER RECOVERY	DEPTH				ICATION!			STRA
(ft) O —	DEPTH	ELEVATION	PER 0.5 ft	NUMBER	(ft) [%]	(ft)					AND REMARKS		SYM
Ū	0.4 0.9	232.3 231.8	1 11/0.4	S1	0.4 [44]	0.0	Dark b _ Dark v	rown, fibrous ellowish brow	to loamy TC n. FINE SAN)PSOIL ND. some-lit	tle silt, occasional fibe	er –	
5 —	0.5	201.0		C1	4.8 [100]	5.7	Moders slightly Joints/ heavily moders	-A ately hard, mo ractured, gro fractures are ratained. Folia	PPROXIMA oderately sevey and brow shallow to mation is mode	-SUBSOIL- TE BEDROO vere to mode nish grey, co noderately di		derately to SS.	
						0.1		Bot	ttom of Explo	oration @ 5	.7 ft (El. 227.0)		
10 —													
15 —													
20 —													
25 —													
Sampler S SL T U	Large Sp Thin Wa	d Split Spoo boon (O.D.: all Tube bed Piston	= 3 in)	Blows/ 0 - 2 - 5 - 9 -	1 4 8	E SOILS Consisten Very Soft Soft Medium S Stiff	tiff	NON-COHI Blows/foot 0 - 4 5 - 10 11 - 24 25 - 50	ESIVE SOILS Density Very Loose Loose Medium De	Ci Lo So ense Li	bil Descriptions apitalized Soil Name ower Case Adjective ome ttle ace	Proportion Major Comporation 35% - 50% 20% - 35% 10% - 20% 1% - 10%	onent

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

0

NR

TB-06

Open End Rod

Auger Flight

Not Recorded

Core Barrel

9 _ 15

16

31

> 60

30

Stiff

Hard

Very Stiff

Very Hard

25 _ 50

> 50

WOR - Weight of Rod

WOH - Weight of Hammer

Dense

Very Dense

Trace

1% - 10%

ENGLISH

New Hampshire

B22 BORING NO. SHEET NO. OF 119+50_OFF._ RT 05 STA. _ N/A US Route 3 BASELINE _ ELEVATION (ft) _ 242.4 START/END ____8/18/10 / 8/18/10

DRILLER C. Cleveland (NHDOT) Doug Rogers INSPECTOR

DRR CLASSIFIER

PROJECT NAME BEDFORD 13527 BRIDGE NO. US Route 3 Bridge Replacement DESCRIPTION **GROUNDWATER EQUIPMENT** SAMPLER **CASING** CORE TYPE SL NW NX BOTTOM OF CASING DEPTH ELEV. воттом DATE TIME SIZE I.D. (in): OF HOLE 1.875 (ft) (ft) 3 3 HAMMER WT. (lb): 140 8/18/10 11:30 am 8.0 234.4 9.4 4.6 DRILL RIG

HAMMER FALL (in): 30 CME 45-C Trlr 1037046/161228 EAST/NORTH (ft) HAMMER TYPE: Automatic STRATUM CHANGE (ft) BLOWS DEPTH DEPTH SAMPLE STRATUM RECOVERY FIELD CLASSIFICATION AND REMARKS PER RANGE NUMBER SYMBOL ELEVATION DEPTH (ft) [%] (ft) 0 -ASPHALT-0.6 241.8 0.6 Dark yellowish brown, gravelly COARSE-FINE SAND, trace silt S1* 2.0 [100] -FILL-Similar to S1 3.1 239.3 Yellowish brown, FINE SAND, little medium sand, trace coarse sand, S2* 2.0 [100] little-trace silt 238.3 4.1 -APPROXIMATE BEDROCK SURFACE-5 Moderately hard to hard, slightly to very slightly weathered, moderately to slightly fractured, coarse-grained, GNEISS. Joints are very close to closely C1 4.7 [98] spaced. Foliation is well-defined and moderate to steep. RQD: 3.1 / 4.8 = 65% 9.4 Bottom of Exploration @ 9.4 ft (El. 233.0) 10 15 Note: * indicates sample was submitted to lab for analysis S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010 2:22:23 PM TB-06 20 25 COHESIVE SOILS NON-COHESIVE SOILS Sampler Identification Soil Descriptions **Proportion** Standard Split Spoon Blows/foot Consistency Blows/foot **Density** Capitalized Soil Name Major Component Large Spoon (O.D.= 3 in) 0 Very Soft 0 -Very Loose Lower Case Adjective 35% - 50% -Т Thin Wall Tube 2 4 Soft 5 10 Loose Some 20% - 35% 11 -U **Undisturbed Piston** 5 -Medium Stiff Medium Dense Little 8 24 10% - 20%

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

- 15

30

60

-

Stiff

Hard

Very Stiff

Very Hard

9

16

31

> 60

0

NR

TB-06

Open End Rod

Auger Flight

Not Recorded

Core Barrel



PROJECT NAME <u>BEDFORD 13527</u> BRIDGE NO. <u>N/A</u>

US Route 3 Bridge Replacement DESCRIPTION **GROUNDWATER EQUIPMENT** SAMPLER **CASING CORE** TYPE SL NW NX BOTTOM BOTTOM OF CASING OF HOLE DEPTH ELEV. DATE TIME SIZE I.D. (in): 1.875 (ft) (ft) 3 3

<u> </u>			(11)		12.2		UAMMED		140		373	INSPECTOR _	Doug No	
_	8/4/10	10:35 am	8.8	231.3	12.0	12.0		R WT. (lb):		DRILL RIG	<u>.</u>	CLASSIFIER	DRR	
	8/4/10	10:45 am	10.7	229.4	12.0	12.0		R FALL (in):	30	CME 45-C Trad	ck rial		1037078/	
- 8	8/4/10	11:00 am	Dry		12.0	12.0	HAMMER	R TYPE:	Automatic	OIVIL 43-0 ITAL	UK TIY	EAST/NORTH (ft)	103/0/0/	101321
С	DEPTH (ft)		CHANGE (ft)	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY	/ RANGE		FIELD	CLASSIFICAT	TION A	AND REMARKS		STRATUM SYMBOL
	0 —			0.5 11		(ft) [%]	(ft)							
	U	0.2	239.9		S1*	1.7 [85]	0.2				n, grav	elly COARSE-FINE S	AND,	
		3.7	238.2		S2*	1.8 [90]	2.2			-F	ILL-	silty", occasional fiber		
-	5 —	3.9 4.2	236.2 235.9	9 8 9	S3	0.7 [35]	4.2	Yellow Mediur	ish brown, FII n dense, yello	NE SAND, some s -SUE owish brown and c	silt, little 3SOIL- dark ye	ew fibers -TOPSOIL- e gravel, few fibers		
		6.4	233.7	10			6.2	MEDIU	JM-FINE SAN	ID, some-little gra -GLACI				
		"	200.7	51	S4	0.5 [71]	6.5 7.2		-A	PPROXIMATE BE				
				50/0.2			7.2	Modera	reyish brown, ately hard-har	very severely to o	comple athered	lely weathered ROCK I, moderately fracture Moderately severe we	d, grey and	
	10 —				C1	4.7 [98]		and ex		ng zone from 10.8		.4'. Joints and fractur		
							12.0							()X(())
									Bott	om of Exploration	@ 12	.0 ft (El. 228.1)		
PM TB-06	15 —							Note: *	indicates sar	nple was submitte	ed to la	b for analysis		
SINTWIPROJECTS/BEDFORD/13527/ROUTE3BORINGS.GPJ 9/20/2010 2:22:24 PM TB-06	20 -													
INTWIPROJECTS/BEDFORD/13527	Sampler S SL T U	Large Sp Thin Wa	d Split Spoo boon (O.D.: all Tube bed Piston	= 3 in)	Blows, 0 - 2 - 5 -	1 4 8	E SOILS Consisten Very Soft Soft Medium S	tiff	NON-COHI Blows/foot 0 - 4 5 - 10 11 - 24	ESIVE SOILS Density Very Loose Loose Medium Dense Dense	Ca Lo So Lit	uil Descriptions epitalized Soil Name wer Case Adjective me ttle	Proportion Major Comp 35% - 50% 20% - 35% 10% - 20%	

25 - 50

WOR - Weight of Rod

WOH - Weight of Hammer

> 50

Dense

Very Dense

Trace

1% - 10%

ENGLISH

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

31

> 60

-

60

Very Hard

Hard

С

NR

TB-06

Core Barrel

Not Recorded

New Hammshire

N/A

PROJECT NAME **BEDFORD 13527** BRIDGE NO. US Route 3 Bridge Replacement

DESCRIPTION **GROUNDWATER EQUIPMENT** SAMPLER **CASING CORE** BOTTOM BOTTOM OF CASING OF HOLE TYPE NW NX DEPTH (ft) ELEV. DATE TIME SIZE I.D. (in): 1.375 1.875 (ft) (ft) 3

BORING NO. **B24** SHEET NO. _ OF_ STA. <u>121+00</u> OFF. <u>LT 180</u> US Route 3 BASELINE _ ELEVATION (ft) _ 229.5 8/3/10 / 8/3/10 START/END _ DRILLER J. Woodward (NHDOT) INSPECTOR J. Woodward

		(ft)	(ft)	OF CASING	OF HOLE	SIZE I.D.		1.375	3	1.875	INSPECTOR _	J. Wood	waru
8/3/10	11:00 am	Dry		11.5	11.5	HAMMER		140	DRILI	<u>L RIG</u>	CLASSIFIER _	DRR	
							R FALL (in):	30		Track rig			
				_		HAMMER	R TYPE:	Automatic	CIVIE 45-C	Track rig	EAST/NORTH (ft)	10372017	10 1333
(ft)		CHANGE (ft) ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVER' (ft) [%]	DEPTH RANGE (ft)		FIELD	CLASSIF	CATION	AND REMARKS		STRAT SYMB
0 -	0.2	229.3	7 18 50/0.4	S1	0.7 [37]	0.0	Dense	rown, fibrous , yellowish bro -medium san	own, FINE S d, occasiona		gravel, some silt, tra	ce	1 d
_	1.9	227.6		C1	4.8 [100]	1.9	slightly zones	ately hard to h fractured, groof moderately	PPROXIMA nard, modera ey and black v severe wea	TE BEDRO	CK SURFACE- tly weathered, moder edium grained, GNEIS extreme fracturing fro	SS. Small om 1.9' to	
5 —						6.7	Foliation	d 6.3° to 6.7°. on is moderate 1.8 / 4.8 = 38	ely well-defir		from 2.1' to 2.6' and 3 o moderate.	3.4° to 4.2°. -	
10 —				C2	4.8 [100]		slightly joints/f well-de	fractured, gr	ey and black shallow dippi to moderate.	k, coarse-me ing. All joints	weathered, moderate edium grained, GNEIS s are discolored. Folia	SŚ.	
						11.5							$\mathcal{Y}/\!$
								Bott	tom of Explo	ration @ 1	1.5 ft (El. 218.0)		
15 —													
20 -													
25 —													
S SL T	Large Sp Thin Wa	Split Spo	= 3 in)	Blows/ 0 - 2 - 5 -	1 4	E SOILS Consisten Very Soft Soft Medium S		NON-COH Blows/foot 0 - 4 5 - 10 11 - 24	ESIVE SOILS <u>Density</u> Very Loose Loose Medium De	e Co	oil Descriptions apitalized Soil Name ower Case Adjective ome ttle	Proportion Major Comp 35% - 50% 20% - 35% 10% - 20%	
	Open En			9 -		Stiff		25 - 50	Dense		race	1% - 10%)
	Auger Fli			16 -		Very Stiff		> 50	Very Dense	<u> </u>			
	Core Bar			31 -		Hard		VOR - Weight					

WOR - Weight of Rod

WOH - Weight of Hammer

ENGLISH

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

31

> 60

-

60

С

NR

TB-06

Core Barrel

Not Recorded



MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME **BEDFORD 13527**

N/A BRIDGE NO.

US Route 3 Bridge Replacement DESCRIPTION **GROUNDWATER EQUIPMENT** SAMPLER **CASING CORE** BOTTOM BOTTOM OF CASING OF HOLE TYPE NW NX DEPTH (ft) ELEV. DATE TIME SIZE I.D. (in): 1.375 1.875 (ft) (ft) 3

BORING NO. **B25** SHEET NO. _ OF_ STA. <u>122+25</u> OFF. <u>LT 330</u> US Route 3 BASELINE _ ELEVATION (ft) _ 203.4 8/3/10 / 8/4/10 START/END _ DRILLER J. Woodward (NHDOT) INSPECTOR J. Woodward

5,2		(ft)	(ft)	OF CASING	OF HOLE	SIZE I.D.	• •	1.375	3	1.875	INSPECTOR _	J. Woodv	vard
8/5/10	8:00 am	6.1	197.3	None	12.5		R WT. (lb):	140	DRILI	L RIG	CLASSIFIER _	DRR	
							R FALL (in):	30	CMF 45-0	Track rig	EAST/NORTH (ft)		
						HAMMER	R TYPE:	Automatic	OIVIL 10 C	7 Track rig	LAST/NORTH (II)		101107
(ft)		CHANGE (ft) ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVER' (ft) [%]	DEPTH RANGE (ft)		FIELD) CLASSIF	FICATION	AND REMARKS		STRATU SYMBO
- 0 -	0.3	203.2	1 1 3	S1	0.9 [45]	0.0	Very lo	rown, fibrous ose, yellowish occasional roc	n brown, FIN	NE SAND, so	ome silt to "silty", trac	e medium	**************************************
	2.0	201.4	6 12 50	S2	1.1 [73]	2.0	Very d gravel,	ense, yellowis little coarse-r	nedium sand	-SUBSOIL- d greyish bro d, occasiona GLACIAL TIL	own, FINE SAND, son	me silt, little gment	
- 5 -	3.5	199.9		C1	4.3 [90]	3.5	fractur Becom from 3	ately hard to hed to sound, g	PPROXIMA nard, modera greyish brow y "schistose"	TE BEDRO	CK SURFACE- to slightly weathered, parse-medium graine o 6.0'. Extreme fractu	d, ĞNÉISS.	•
- 10 -				C2	4.7 [98]	8.3	and bla to 11.2	moderately to ack, coarse-m ''. Foliation is 2.0 / 4.8 = 42	edium grain steep, where	ed, GNEISS	erately fractured to so S. High angle fracture s.	ound, grey ⁻ s from 8.7'	
						13.1							7//>
								Bott	om of Explo	ration @ 13	3.1 ft (El. 190.3)		
- 15 -													
- 20 —													
- 25 —													
Sampler S SL T U	Standard Large Sp Thin Wa	d Split Spo boon (O.D.	.= 3 in)	Blows/ 0 - 2 - 5 -	1 4	E SOILS Consisten Very Soft Soft Medium S		NON-COHI Blows/foot 0 - 4 5 - 10 11 - 24	ESIVE SOILS Density Very Loose Loose Medium De	e Ca	bil <u>Descriptions</u> apitalized Soil Name ower Case Adjective ome ttle	Proportion Major Comp 35% - 50% 20% - 35% 10% - 20%	
0	Open En			9 -		Stiff		25 - 50	Dense		race	1% - 10%	
Α	Auger Fli			16 -		Very Stiff		> 50	Very Dense	e			
C	Core Bar			31 -		Hard		VOR - Weight			ENO		

WOR - Weight of Rod

WOH - Weight of Hammer

ENGLISH

Very Hard

Hard

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

5

9 -

16

31

> 60

-

8

15

30

Medium Stiff

Very Stiff

Very Hard

Stiff

Hard

PROJECT NAME **BEDFORD 13527**

S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010 2:22:29 PM TB-06

U

0

NR

TB-06

Undisturbed Piston

Open End Rod

Auger Flight

Core Barrel

Not Recorded

New Hampshire

BORING NO. SHEET NO. _ 1___ OF _ STA. <u>123+00</u> OFF. <u>LT 150</u> N/A BRIDGE NO.

US Route 3 BASELINE _ ELEVATION (ft) __ 212.6

8/3/10 / 8/3/10 START/END ____ DRILLER J. Woodward (NHDOT)

B26

US Route 3 Bridge Replacement DESCRIPTION **GROUNDWATER EQUIPMENT** SAMPLER **CASING CORE** DATE TIME DEPTH ELEV. BOTTOM BOTTOM TYPE: NW

	DATE	TIME	DEPTH (#)	ELEV.	BOTTOM OF CASING	BOTTOM _	SIZE I.D.	(in):	1 375	3		INCREATOR		
			(ft)	. ,				. ,	1.375			INSPECTOR _	J. Woody	
	8/3/10	1:45 pm	8.6	204.0	10.0	12.0		R WT. (lb):	140	DRILI		CLASSIFIER _	DRR	
						-	HAMMER	R FALL (in):	30 Automatic	CME 45-C	Track rig	EAST/NORTH (ft)	1037454/	161203
				l	1		1	TIPE.	Automatic					
	DEPTH (ft)		CHANGE (ft) ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)		FIELD	CLASSIF	ICATION .	AND REMARKS		STRATUM SYMBOL
	- 0 -	0.2	212.4	2	1	() [- 1	0.0	Dork b	roug fibrous	TORCOIL				
		0.2	212.7	6 8	S1	0.9 [45]		Mediur	<u>rown, fibrous</u> n dense, dark oarse-mediur	greyish bro	wn, FINE S	AND, some-little silt, l	ittle gravel,	
				•	3		2.0	ti doc o	oarse mealar	ii odila	-FILL-			
		2.0	210.6	5			2.0	Loose	vellowish bro	wn_dark vel		n, FINE SAND, little s	ilt trace	0:0:0:
				5	S2	1.0 [50]			-medium san	d			nt, trace	0:00:
					5		4.0			-GL	ACIAL FLU\	/IAL-		1/6/1
				11			4.0							0.70.
	- 5 -			9 7	S3	1.0 [50]						reyish brown, MEDIU	M-FINE _	// 0//
				, ,	3		6.0	SAND,	trace coarse	sand, over o	olive, SIL I			1/3//
				11			6.0	N A madicus		OII T /		fine count include		0.00
				8	S4	1.5 [75]		vellowi	n dense, olive sh brown mot	tle	-conesive), t	race fine sand, isolate	ea	//0//
		7.5	205.1	11				yonom	011 010111111101					(1 1 L 1
				11	·		8.0	Very d	ence olive-lia	ht alive brow	un eilty FINE	E SAND, little medium	s cand	
				22	S5	1.3 [65]						al very severely weath		1/1
				40		1.0 [00]		fragme						
	− 10 −			33	` 		10.0			-(SLACIAL TIL	.L-	_	1
				42				Vory d	oneo olivo ar	NEDILIN	I EINIE CANI	D, some silt, little-trac	o coarco	(1)
				48	S6	1.0 [50]						ely weathered rock fra		ΔΔΔΔ
				43	3		12.0							1
									Bott	om of Explo	ration @ 12	2.0 ft (El. 200.6)		
										·	•	,		
	– 15 –													
	13													
9														
9														
≥														
22:29 PM														
7	— 20 —													
2														
720														
3/2														
3														
Š														
S														
Š														
E3	– 25 –													
Ź														
352														
ב ב														
Š														
NBEDFORD/1352//KOUTE3BORINGS.GPJ 9/20/2														
S	Sampler	Identifica	l	1	+	COHESIVE	SOILS		NON-COH	ESIVE SOILS		oil Descriptions	Proportion	1
JE L	Sampler S		d Split Spo	on	Blows		Consisten	cv F	Blows/foot	Density		oil Descriptions apitalized Soil Name	Major Comp	onent
5	SL	Large Sp	ooon (O.D.		0 -	1 \	Very Soft	- *	0 - 4	Very Loose		ower Case Adjective	35% - 50%	
WITHOUT	T	Thin Wa			2 -	4 5	Soft		5 - 10	Loose		ome	20% - 35%	
_	11	1 Indictor	had Dieton	1	5 -	8 N	Madium S	TITT I 1	11 - 24	Madium Da	ane∆ I lit	HIA	10% - 20%	

11 -

25 -

> 50

24

50

WOR - Weight of Rod

WOH - Weight of Hammer

Medium Dense

Very Dense

Dense

Little

Trace

10% - 20%

ENGLISH

1% - 10%

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

DESCRIPTION US Route 3 Bridge Replacement

GROUNDWATER

С

NR

TB-06

Auger Flight

Core Barrel

Not Recorded

16

31

> 60

- 30 - 60

Hard

Very Stiff

Very Hard



N/A

MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME **BEDFORD 13527** BRIDGE NO.

EQUIPMENT

SAMPLER **CASING CORE** SL NW NX

BORING NO. **B27** SHEET NO. ____1__ OF _ STA. <u>124+74</u> OFF. <u>LT 05</u> US Route 3 BASELINE __ ELEVATION (ft) __ 237.9 START/END <u>8/18/10 / 8/18/10</u> DRILLER C. Cleveland (NHDOT) INSPECTOR Doug Rogers

			GROUNL	JWATE	۲		EQUIP	MENI	SAMPLER	CASING	CORE	51AR1/END	
	DATE	TIME	DEPTH	ELEV.	воттом	воттом	TYPE:		SL	NW	NX	DRILLER C. Cleveland (N	
ļ			(ft)	(ft)	OF CASING		SIZE I.D.		3	3	1.875	INSPECTOR Doug R	
ļ	8/18/10	1:15 pm	7.7	230.2	9.0	13.8		R WT. (lb):	140	<u>DRILI</u>	<u>L RIG</u>	CLASSIFIERDR	R
-	8/18/10	1:30 pm	7.5	230.4	9.0	13.8		R FALL (in):	30	CME 45	5-C Trlr	_ EAST/NORTH (ft)103748	7/160966
ŀ				l	1		HAMMER	CITPE.	Automatic				
	DEPTH (ft)		CHANGE (ft) ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)		FIELD	CLASSIF	CATION	N AND REMARKS	STRATUM SYMBOL
l	- 0 -							-ASPI-	IALT-				
		0.8	237.1				0.8	7 .0					XXXXXX
							0.0	Dark v	ellowish browi	n. gravelly C	OARSE-F	FINE SAND, trace silt	
					S1*	1.9 [95]		,		, 0		•	
							2.8				-FILL-		
							2.8		to C1 noted	amall aabble	o et 2 C!		
		3.6	234.3		S2*	2.0 [100]		- $ -$	to S1, noted				-
					02	2.0 [100]			trace coarse		ttie siit, iitt	le-trace medium sand, trace fine	
	_						4.8				rface enco	ountered from 4.7-4.8'	
ĺ	- 5 -			11			5.0		,	· ouumuj ou.			$\neg \times \times \times \times$
				6	S3	0.8 [40]		Mediu	m dense, grey	ish brown a	nd dark ye	ellowish brown, MEDIUM-FINE to	
				7		[]		COAR	SE-FINE SAN	ID, some-litt	tle silt		
				4	3		7.0						
				4			10					orown, COARSE-FINE SAND,	
				4	S4	0.4 [20]			completely we			yellowish brown and dark greyish	
		0.0	200.0	35	5		9.0		drill rods/spoor				
		9.0	228.9				9.0		•			OCK SURFACE-	
ļ	– 10 –								, ,	1110711111111	IL DEDIT	0011001117102	
								Moder	atelv hard to h	ard. modera	ately weath	nered, moderately fractured, grey,	
					C1	4.8 [100]						Joints are closely spaced and	
											cking of co	re surface is evident.	
								RQD:	$2.7 / 4.8 = 56^{\circ}$	%			
							13.8						<u> </u>
									Bott	om of Explo	ration @	13.8 ft (El. 224.1)	
ŀ	– 15 <i>–</i>												
90-													
:22:30 PM TB-06													
Ρ													
30													
2:22	– 20 –							Note: '	' indicates san	nple submitt	ed to lab f	or analysis	
/20													
9/20													
5													
S.GI													
ŊĠ													
ORI													
3B(. OF												
5	– 25 –												
8													
527													
)/13													
Ж													
DF													
S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010													
CTS	Sampler	Identifica	ation	•		COHESIV	E SOILS		NON-COHE	SIVE SOILS	;	Soil Descriptions Proportion	1
9	S	Standard	Split Spoo		Blows		Consisten	cy I	Blows/foot	Density		Capitalized Soil Name Major Cor	mponent
PR	SL	• •	ooon (O.D.:	= 3 in)	0 -		Very Soft		0 - 4	Very Loose		Lower Case Adjective 35% - 50	
≨	T U	Thin Wa	ılı Tube bed Piston		2 - 5 -		Soft Medium S	tiff .	5 - 10 11 - 24	Loose Medium De		Some 20% - 35 Little 10% - 20	
N.	0	Open Er			9 -		Stiff		11 - 24 25 - 50	Dense		Trace 10% - 20	
S:\c	Ä	Auger Fl			16 -		Verv Stiff		> 50	Very Dense		170 - 10	. , .

WOR - Weight of Rod

WOH - Weight of Hammer

> 50

Very Dense

ENGLISH

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

31

> 60

NR

TB-06

Core Barrel

Not Recorded

60

Very Hard

Hard

WOR - Weight of Rod

WOH - Weight of Hammer

ENGLISH

GROUNDWATER



MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME **BEDFORD 13527** BRIDGE NO.

N/A

DESCRIPTION US Route 3 Bridge Replacement **EQUIPMENT** SAMPLER **CASING CORE** TYPE: NW NX BOTTOM BOTTOM OF CASING OF HOLE

BORING NO. **B28** SHEET NO. _ _1__ OF __ STA. <u>127+50</u> OFF. <u>LT 55</u> US Route 3 BASELINE _ ELEVATION (ft) __ 219.3 START/END __ 8/2/10 / 8/2/10 DRILLER J. Pierce (NHDOT)

		CITOOIT	J 1 1 7 1 1 L			LQUII		O WIN LLIN	0,101110	OOKE	551155	Pierce (NHD	OT)
DATE	TIME	DEPTH	ELEV.	воттом	воттом	TYPE:		S	NW	NX			
57.112		(ft)	(ft)	OF CASING	OF HOLE	SIZE I.D.		1.375	3	1.875	INSPECTOR _	Doug Ro	
8/2/10	10:15 am	Dry		6.5	6.5		R WT. (lb):	140	DRIL	L RIG	CLASSIFIER _	DRR	
							R FALL (in):	30	CME 45-0	Track rig	EAST/NORTH (ft)		
			1	<u> </u>		HAMMER	R TYPE:	Automatic	OIVIE TO C	, maoning	LAST/NORTH (II)	1007002	1
DEPTH	STRATUM	CHANGE (ft)	BLOWS	SAMPLE	SAMPLE	R DEPTH					AND DEMARKS		STRATUN
(ft)	DEPTH	ELEVATION	PER 0.5 ft	NUMBER	RECOVER (ft) [%]	RY RANGE (ft)		FIELL	CLASSIF	-ICATION	AND REMARKS		SYMBOL
⊢ 0 −			1		(14)[14]	0.0							XXXXX
	0.7	218.6	2				_ <u>Dark b</u>	rown, loamy	T <u>opsoil</u> _				
	0.7	210.0	11	S1	1.2 [71]		Dark b	rown and dar	k greyish bro	own, MEDIL	JM-FINE SAND, some	e silt to	
	1.7	217.6	15/0.	2		1.7	"silty",	little gravel, lit	ttle coarse s	and -l	FILL-	_	
	'.'	217.0	13/0.	-		1.7		-A	PPROXIMA	TE BEDRO	CK SURFACE-		
							Modor	ataly bard to h	ard mader	ataly to aligh	itly weathered, moder	otoly to	
							eliahtly	atery naru to r r fractured an	ev coarse-c	rained GNF	EISS. Joints/fractures	alciy lu	
				C1	4.7 [98]		shallov	v dippina to n	ear-horizont	al Zone of s	severe weathering and	d extreme	K//X
_											den loss of drilling flui		
− 5 −	1							nainder of the		,	3 .	_	Y//)X/
								3.1 / 4.8 = 65					
						6.5							
								Pot	ttom of Eval	oration @ 6	E ft /EL 212.0\		
								БО	ttorri or Expi	oralion @ 0	5.5 ft (El. 212.8)		
						1							
- 10 -	1 1												
10													
− 15 −	- 1												
9													
1B-06													
-													
Md 125:33 — 20 —													
55													
있는 20 -	1					1							
.00													
/20													
6						1							
GP.						1							
SS													
ĭ						1							
Ö.						1							
3E]												
발 25 -]												
8						1							
727						1							
135													
Δ Q						1							
Ö						1							
						1							
S:/GINTW/PROJECTS/BEDFORD/13527/ROUTE3BORINGS.GPJ 9/20/2010 A O O L T S S W S S W S S S S S S S S S S S S S													
Sampler	Identifica	ation	- <u></u>		COHESIN	/E SOILS		NON-COH	ESIVE SOILS	S S	oil Descriptions	<u>Proportion</u>	
팅 s		d Split Spo		Blows		Consisten	су і	Blows/foot	Density		apitalized Soil Name	Major Comp	
》 SL		oon (O.D.	= 3 in)	0 -	1	Very Soft		0 - 4	Very Loose		ower Case Adjective	35% - 50%	
≱ T	Thin Wa			2 -	4	Soft		5 - 10	Loose	I	ome	20% - 35%	
E U		bed Pistor	1	5 -	8	Medium S		11 - 24	Medium De	I	ittle	10% - 20%	
[0] O	Open En			9 -	15	Stiff		25 - 50 > 50	Dense Ven Dense	I	race	1% - 10%	
ഗ် A	Auger Fl	ignt		16 -	30 60	Very Stiff		> 50 NOR - Weight	Very Dense	e			

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

Core Barrel

Not Recorded

NR

TB-06

-

60

31

> 60

Very Hard

Hard

WOR - Weight of Rod

WOH - Weight of Hammer

ENGLISH



PROJECT NAME **BEDFORD 13527** N/A BRIDGE NO.

US Route 3 Bridge Replacement DESCRIPTION **GROUNDWATER EQUIPMENT** SAMPLER **CASING CORE** BOTTOM BOTTOM OF CASING OF HOLE TYPE: NW NX DEPTH (ft) ELEV. DATE TIME SIZE I.D. (in): 1.875 (ft) 1.375 3

BORING NO. **B29** SHEET NO. _ _1___ OF __ STA. <u>127+97</u> OFF. RT 29 US Route 3 BASELINE _ ELEVATION (ft) _ 221.5 8/2/10 / 8/2/10 START/END __ DRILLER J. Pierce (NHDOT) INSPECTOR Doug Rogers

DATE	TIIVIE	(ft)	` ′	OF CASING			D. (in):	1.375	3	1.875	INSPECTOR _	Doug Ro	-
8/2/10	12:05 pm		208.4	16.1	16.1		IER WT. (lb):	140	<u>DRILI</u>	<u>L RIG</u>	CLASSIFIER _	DRR	
8/2/10	12:45 pm	13.2	208.3	16.1	16.1		IER FALL (in): IER TYPE:	30 Automatic	CME 45-0	C Track rig	EAST/NORTH (ft)	1037587/	160662
	STRATUM	CHANGE (ft)	BLOWS		SAMPLER	1		71010111011			, ,		
DEPTH (ft)			PER	SAMPLE NUMBER	RECOVER'	Y RANG		FIELD	CLASSIF	ICATION	AND REMARKS		STRATU
- 0 -	DEPTH	ELEVATION	0.5 ft	TTO MIDELL	(ft) [%]	(ft)							050
U							Advan	ced hole to 1.	0' through a	sphalt shoul	der, fill materials		
			9			1.0							\bowtie
			11								IUM-FINE SAND, sor	ne silt,	
			11	S1	0.9 [45]		some-	little gravel, lit	tie coarse sa	and			\bowtie
			13	3			3.0			-FILL-			\bowtie
			13			3.0							\bowtie
			21	S2	1.1 [55]		Dense	, dark grey-da	ırk brownish	grey, MEDI	UM-FINE SAND, sor	ne silt to	\bowtie
			14					little-trace gra	ivel, trace co	oarse sand, i	isolated wood fragme	ent	\bowtie
- 5 -	-		13	` <u> </u>		5.0	5.0					-	₩
			18				Donos	dork grov da	urk brownich	arov and de	ark brown, silty MEDI	I IN EINE	\bowtie
			10	S3	0.8 [40]						occasional wood frag		
			11				7.0	, como intio gi	avoi, iitilo o	oaroo oarra,	occacional wood mag	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	\bowtie
			6			7.0		m danaa darl	arouich bro	NAME AND ILL	M FINE CAND some	a cilt to	
			6	S4	0.6 [30]						M-FINE SAND, some sional very severely w		
			8 10				rock fr	agment	oana, mac g	ji avoi, oodac	sional very severely w	catricica	
			28	' <u> </u>		9.0	9.0	- 3					\bowtie
4.0			21	0.5	0.0.1401		Dense	dark grov an	d dark brow	nich arov c	oarse-fine sandy GRA	Δ\/EI .w/	\bowtie
– 10 –	1		15	S5	0.8 [40]			ly weathered				¬VLL, W/ _	\longrightarrow
			12		0.01071	11.0 1	1.0		_	_			\bowtie
	11.3	210.2	50/0.3	S6	0.2 [67]	11.0 1	Grey,	gravel-sized, v					\otimes
								-A	PPROXIMA	TE BEDKO	CK SURFACE-		
							Mada	-4-1 11 4- 1		_4_ 4 :_		-4-14-	
				C1	4.7 [98]						itly weathered, moder ANITIC GNEISS. Mos		
							ioints/	ractures are s	shallow dippi	ing to near-h	norizontal.	ot all	
- 15 —	1						RQD:	2.9 / 4.8 = 60	%	J		_	
						1	5.1						<i>Y//</i>)
								Bott	tom of Explo	oration @ 16	6.1 ft (El. 205.4)		
- 20 —	1												
0.5													
25 —	1												
Sampler	Identifica	ation		1	COHESIV	E SOIL	3	NON-COH	ESIVE SOILS	S S	oil Descriptions	Proportion	
S	Standard	d Split Spo		Blows		Consis		Blows/foot	Density	C	apitalized Soil Name	Major Comp	
SL		poon (O.D.	= 3 in)	0 -		Very Soft	oft	0 - 4	Very Loose		ower Case Adjective	35% - 50%	
T U	Thin Wa	all Tube bed Piston	,	2 - 5 -		Soft Mediun	Stiff	5 - 10 11 - 24	Loose Medium De	I	ome ittle	20% - 35% 10% - 20%	
0	Open Er		'	9 -		Stiff	I	11 - 24 25 - 50	Dense	I	race	1% - 20%	
Ä	Auger Fl			16 -		Very St		> 50	Very Dense	I	-	.,5 1070	
C	Core Ba			31 -		Hard		NOR - Weight			ENO		

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION



PROJECT NAME **BEDFORD 13527** N/A BRIDGE NO. US Route 3 Bridge Replacement DESCRIPTION

GROUNDWATER EQUIPMENT SAMPLER **CASING CORE** TYPE: NW NX DEPTH (ft) BOTTOM BOTTOM OF CASING OF HOLE ELEV. DATE TIME SIZE I.D. (in): 1.875 1.375 (ft) 3

BORING NO. **B30** SHEET NO. _ _1___ OF _ STA. <u>128+74</u> OFF. <u>LT 45</u> US Route 3 BASELINE _ ELEVATION (ft) _ 209.6 7/30/10 / 7/30/10 START/END ___ DRILLER J. Pierce (NHDOT) INSPECTOR Doug Rogers

DATE	TIIVIE	(ft)	(ft)	OF CASING	OF HOLE	SIZE I.D.		1.375	3	1.875	INSPECTOR _	Doug Ro	gers
8/2/10	8:00 am	11.6	198.0	None	12.1		R WT. (lb):	140	DRILI	L RIG	CLASSIFIER _	DRR	
							R FALL (in):	30	CME 45-0	C Track rig	EAST/NORTH (ft)	1037679/	160609
			T	1		HAMMEI		Automatic			ZACIATOR (II)		1
DEPTH (ft)		CHANGE (ft)	BLOWS PER	SAMPLE NUMBER	SAMPLER RECOVER	Y RANGE		FIELD	CLASSIF	ICATION	AND REMARKS		STRATU
- 0 -	DEPTH	ELEVATION	0.0	T.O.I.D.E.I.	(ft) [%]	(ft)							
	0.2	209.4	3 5	S1	0.6 [60]	0.0		rown, fibrous					
	1.0	208.6	10/0			1.0		orown and dar coarse-mediur		orown, FINE FILL-	SAND, some-little fir	ne gravei,	+
			10,0				\tilace c				 CK SURFACE-		
							Advan				t; cutting steady w/ 5	00psi	
						2.5	downfe	eed pressure	to 2.5'				
							Moder	ately hard mo	oderately sev	vere to mode	erately weathered, mo	oderately to	
							slightly	fractured, gr	ev-black and	d brownish o	rev. coarse-grained.	GNEISŚ.	
_				C1	4 7 [00]		Intrude	ed w/ coarse-g	grained GRA	NITE through	ghout the run. Joints/	fractures	
- 5 —					4.7 [98]						tion appears steep to ng fluid loss at 2.7' for		
								ider of boring.		i, iolai uriiii	ig ilulu ioss at 2.7 Toi	ruie	
							RQD:	2.5 / 4.8 = 52	%				
						7.3							
						7.3	1						
							Hard.	slightly weath	ered, modera	ately to sligh	ntly fractured, grey an	nd black.	
					4.0.5400		coarse	grained, GNI	EISŚ. Intrud	led w/ coarse	e-grained GRANITE 1	from 10.2'	X//>
10 —				C2	4.8 [100]				on within the	e gneiss is s	steep to moderate, wh	nere _	-\XX
							discerr	11ble. 3.8 / 4.8 = 79	%				
							I NGD.	0.07 4.0 70	70				
						12.1							7//
								Bott	tom of Explo	ration @ 12	2.1 ft (El. 197.5)		
											- (
15 —													
20 —													
25													
25 —													
				1									
				1									
				1									
				1									
		<u>.</u>			001:50:	<u> </u>	<u> </u>	NON OCCU	EON /E 00" 0	, 1			
	Identifica		on	Player	COHESIV		,		ESIVE SOILS		oil Descriptions	Proportion Major Comm	nonon t
S SL		d Split Spo boon (O.D.		Blows/ 0 -	1	Consister Very Soft		Blows/foot 0 - 4	Density Very Loose		apitalized Soil Name ower Case Adjective	Major Comp 35% - 50%	
Т	Thin Wa	all Tube	,	2 -	4	Soft		5 - 10	Loose	S	ome	20% - 35%	, 0
U		bed Piston	1	5 -	8	Medium S		11 - 24	Medium De	I	ttle	10% - 20%	
O A	Open Er Auger Fl			9 -	15 30	Stiff Very Stiff		25 - 50 > 50	Dense Very Dense	I	race	1% - 10%	0
C	Core Ba			31 -	30 60	Very Still		> 50 NOR - Weight			ENO		

WOR - Weight of Rod

WOH - Weight of Hammer

ENGLISH

С

NR

TB-06

Core Barrel

Not Recorded

31

> 60

60

Very Hard

Hard

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION



MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME **BEDFORD** 13527

N/A BRIDGE NO.

US Route 3 Bridge Replacement DESCRIPTION

Very Hard

Hard

WOR - Weight of Rod

WOH - Weight of Hammer

31

> 60

С

NR

TB-06

Core Barrel

Not Recorded

GROUNDWATER EQUIPMENT SAMPLER **CASING CORE** TYPE: NW NX BOTTOM BOTTOM OF CASING OF HOLE DEPTH ELEV. DATE SIZE I.D. (in): 1.375 1.875 (ft) (ft) 3 7/30/10 11:00 am HAMMER WT. (lb): 140 DRILL RIG 15.5 190.0

BORING NO. **B31** SHEET NO. _ __1___ OF _ STA. 130+00 OFF. LT 55 US Route 3 BASELINE _ ELEVATION (ft) _ 205.5 START/END _____7/30/10 / 7/30/10 DRILLER J. Pierce (NHDOT) Doug Rogers INSPECTOR _ CL ACCITIED

ENGLISH

l	7/30/10	11:00 am	15.5	190.0	30.9	30.9	HAMMER	WT. (lb):	140	DRILL RIG		CLASSIFIER	DRR	
	7/30/10	11:15 am	15.6	189.9	30.9	30.9		FALL (in):	30	CME 45-C Trac	k ria		1037723/	
							HAMMER	TYPE:	Automatic	CIVIL 45-C TIAC	жпу	EAST/NORTH (ft)	10377237	100400
	DEPTH	STRATUM	CHANGE (ft)	BLOWS	SAMPLE	SAMPLER	DEPTH				-10.	AND DENABLES		STRATUM
	(ft)	DEPTH	ELEVATION	PER 0.5 ft	NUMBER	RECOVERY (ft) [%]	RANGE (ft)		FIELD	CLASSIFICAT	ION	AND REMARKS		SYMBOL
	- 0 -			0.0 10		(11) [70]	0.0							
		0.3	205.2	2			0.0	¬ <u>Dark</u> b	rown, fibrous	TOPSOIL		. – – – – – – – – .	<i>- -</i>	
				4	S1	1.2 [60]		Mediui	n dense, dark	greyish brown-gr	eyish	brown and dark yellow	ish brown,	
				8						ID, little gravel, littl	le silt,	trace coarse sand, w/	isolated	
				6			2.0	piece o	of asphalt					
				3			2.0					own, FINE SAND, trac	e gravel,	
				4	S2	0.8 [40]		trace r	nedium sand,	occasional wood f	fragme	ent		
				5										
				_ 4			4.0				LL-			
		4.7	200.8	5			1.0		ark greyish br	own, fine sandy S	ILI, tr	ace gravel, trace coars	se-medium	
ŀ	- 5 -	4.7	200.0	5 7	S3	1.2 [60]		Sand	h brown and a	dark vallavijah brav	410 FI	NE CAND little oilt tee	/_	
				5						rown, silty FINE S		NE SAND, little silt, tra	ace coarse	1/6//
				7			6.0	Sanu, (over greyisii b	iowii, siity fine s	AND			0: >0:
				6							N = 0	AND CEINE OAND II	/	1/6//
				7	S4	1.3 [65]						AND to FINE SAND, lit	ttle silt w/	00000
				7				occasi	onai taint dark	k yellowish brown i	mottie	S		1/6//
				'			8.0							0.70
										-GLACIAL		/1.1.1		1/6//
										-GLACIAL	. FLU	VIAL-		0.70.
														1/6//
ŀ	− 10 −			6			10.0						_	10.70.7
				6										6.6%
				8	S5	1.2 [60]		Mediu	m dense, grey	rish brown, FINE S	Sand,	little-trace silt		1.7.7.7.7
				9			12.0							(6/2)
							12.0							1.7.7.7.7
														(0.00)
														1.7.77.7
														(6.0%)
														1./././/
	45													K. (0 %)
l	– 15 –			6			15.0						_	
				8	S6	1 0 [50]		Mediu	m dense arev	ish brown and vell	lowish	brown, FINE SAND,	some-little	
				8	30	1.0 [50]			n sand, slight			, orovin, r inte or utb,	oomo mao	1./././/
				7			17.0		,					0.0%
														1././/
90														0:000
TB-06														1/2/1
														0:000
6 P		19.5	186.0											1.1.1.1.1
2:22:36 PM	- 20 -	19.5	100.0										_	14
	20			10	0.7	0.0.1001	20.0					E SAND, some silt, litt		Δ ' Δ
10				14	S7	0.8 [62]	04.0				sional	severely weathered ro	ock	
20/2010		21.3	184.2	28/0.3			21.3	fragme		-GLACIAL TILL-				X//XX
9/2(-A	PPROXIMATE BE	DRO	CK SURFACE-		
2														Y //> X //
9.														
GS					04	4 4 5051		Hard, s	slightly weathe	ered, slightly fractu	ured to	sound, grey, coarse-	grained,	
〗					C1	4.1 [85]						4.8' w/ sudden drop of		
80								Joints	are near-horiz	zontal.		·		
E3	- 25 -							RQD:	4.0 / 4.8 = 83	%			_	<u> </u>
Σ														
岁							26.1							
527							26.1							
13														
ß														\mathbb{K}/\mathbb{K}
잂												RANITIC GNEISS. Mo		
띮					C2	4.7 [98]						s are shallow dipping t	0	X///X//
S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ					<u> </u>		- 00" 0	<u>nęar-h</u>		ation is poorly defi				<u> </u>
띩		Identifica] _B .	COHESIVI		.		ESIVE SOILS		oil Descriptions	Proportion	
OJE	S		d Split Spo		Blows		Consisten	cy i	Blows/foot	<u>Density</u>		apitalized Soil Name	Major Comp	
PR	SL T	Thin Wa	oon (O.D.	s m)	0 -		Very Soft Soft		0 - 4 5 - 10	Very Loose Loose		ower Case Adjective	35% - 50% 20% - 35%	
٤	Ü		iii Tube bed Pistor	1	5 -		อดเ Medium S	tiff .	5 - 10 11 - 24	Medium Dense		ttle	10% - 35%	
Z.	Ö	Open En			9 -		Stiff		25 - 50	Dense		race	1% - 10%	
S:(C	A	Auger FI			16 -		Very Stiff		> 50	Very Dense			1,0 10,0	•
ဖ	Ċ	Core Ba			31 -		Hard		VOR - Weight					

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS\GPJ 9/20/2010 2:22:36 PM TB-06

TB-06

65



BORING NO. **B31** SHEET NO. _ 2 OF_ STA. <u>130+00</u> OFF. <u>LT 55</u> US Route 3 BASELINE _

MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME **BEDFORD 13527** BRIDGE NO. _ US Route 3 Bridge Replacement DESCRIPTION 205.5 ELEVATION (ft) STRATUM CHANGE (ft) BLOWS PER 0.5 ft SAMPLER RECOVERY (ft) [%] DEPTH RANGE (ft) SAMPLE NUMBER DEPTH STRATUM SYMBOL FIELD CLASSIFICATION AND REMARKS ELEVATION RQD: 4.4 / 4.8 = 92% 30 30.9 Bottom of Exploration @ 30.9 ft (El. 174.6) 35 - 40 45 50 55 60 -

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010 2:22:38 PM TB-06

Thin Wall Tube

Open End Rod

Auger Flight

Not Recorded

Core Barrel

Undisturbed Piston

U

0

NR

TB-06

2

5

9

16

31

> 60

8

- 15 - 30 - 60

Soft

Stiff

Hard

Medium Stiff

Very Stiff

Very Hard



MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME **BEDFORD 13527** BRIDGE NO. _

BORING NO. **B32** SHEET NO. ____1__ OF ___ STA. <u>131+40</u> OFF. <u>LT 50</u> US Route 3 BASELINE _ ELEVATION (ft) __ 205.9 START/END _____7/29/10 / 7/29/10 DRILLER J. Pierce (NHDOT) Doug Rogers INSPECTOR _ CL ACCITIED

DESCI	RIPTION	US	Route	3 Bridge	e Repla	cement				
		GROUN	DWATE	₹		EQUIP	MENT	SAMPLER	CASING	CORE
DATE	TIL 45	DEPTH	ELEV.	воттом	воттом	TYPE:		S	NW	
DATE	TIME	(ft)	(ft)	OF CASING		SIZE I.D.	(in):	1.375	3	
7/29/10	1:45 pm	15.9	190.0	18.0	22.9	HAMMER	R WT. (lb):	140	DRIL	L RIG
7/29/10	2:00 pm	15.9	190.0	18	22.9	HAMMER	R FALL (in):	30		Track rig
						HAMMER	R TYPE:	Automatic	CIVIE 45-C	, mack ng
	STRATUM (CHANGE (ft)	BLOWS		SAMPLEE	DEPTH				

15.9 19.0 18.0 19.0 18.1 22.8 19.0	7/29/10	1:45 pm		-	190.0	T	18.0	22.9		R WT. (lb):	140	DRILL RIG	CLASSIFIERDRI	₹
STRATUM CHANGE BLOW SAMPLE DEPTH ELEVATION COST.	7/29/10	2:00 pm	15.9	Ľ	190.0	+	18	22.9			30 Automatic	CME 45-C Track rig		/160354
DEPTH LEVATION OF 0.5 Notified Recovery RANCE (1)(1)(1) (1) (1) (1) (1) (1) (1) (1) (STRATIIM	CHANGE (ff	1 1	BI OM	I IS	I	SAMPI FR			Automatic		. ,	1
205.3 3 S1 1.0 [67]	DEPTH (ft)			4	PER	₹ .	SAMPLE NUMBER	RECOVERY	RANGE		FIELD	CLASSIFICATION	AND REMARKS	STRAT
4.0 201.9 4 6 S2 1.3 [65] 5 Advanced hole wire roller bit through cobble from 1.5 to 2.1 -FILL- Dark greyish brown and dark yellowish brown, MEDIUM-FINE SAND, some silt. It race coarse sand yellowish brown, MEDIUM-FINE SAND, trace silt, over yellowish brown, FINE SAND, trace medium sand Medium dense, greyish brown, FINE SAND, trace medium sand Medium dense, greyish brown, FINE SAND, little-trace silt, trace coarse sand from 8.0' Medium dense, greyish brown and yellowish brown, FINE SAND, little-trace silt, trace coarse sand from 8.0' Medium dense, greyish brown and yellowish brown, FINE SAND, little-trace silt -GLACIAL FLUVIAL- Medium dense, yellowish brown, FINE SAND, little silt -GLACIAL FLUVIAL- Medium dense, yellowish brown, FINE SAND, little silt -GLACIAL FLUVIAL- Medium dense, yellowish brown, FINE SAND, little silt -GLACIAL FLUVIAL- Medium dense, yellowish brown, FINE SAND, little silt -GLACIAL FLUVIAL- Loose, greyish brown, MEDIUM-FINE SAND, little-trace coarse sand Loose, greyish brown, MEDIUM-FINE SAND, little-trace coarse sand, slight trace of silt	0 —	0.6	205.3	1			S1	1.0 [67]	0.0				and dark vellowish brown. FINE	-
4.0 201.9 4 6 8 S2 1.3 [65] 5.0 Dark greyish brown and dark yellowish brown, MEDIUM-FINE SAND, some silt, trace coarse sand Yellowish brown, COARSE-FINE SAND, trace silt, over yellowish brown, FINE SAND, little silt Yellowish brown, FINE SAND, ittle silt yellowish brown, FINE SAND, ittle silt yellowish brown, FINE SAND, ittle-trace silt, trace coarse sand from 8.0' 8						0/0			1.5	SAND,	some silt to '	'silty", refusal of split sp	oon at 1.5'	
4.0 201.9 6 6 S2 1.3 [65] 5.0 S1									2.0			-FILL-		
Medium dense, greyish brown, FINE SAND, trace medium sand Medium dense, greyish brown, FINE to MEDIUM-FINE SAND, little-trace silt, trace coarse sand from 8.0* Medium dense, greyish brown and yellowish brown, FINE SAND, trace silt Medium dense, greyish brown and yellowish brown, FINE SAND, trace silt GLACIAL FLUVIAL- Medium dense, yellowish brown, FINE SAND, little silt Medium dense, yellowish brown, FINE SAND, little silt Medium dense, greyish brown, FINE SAND, little silt Loose, greyish brown, MEDIUM-FINE SAND, little-trace coarse sand Loose, greyish brown, MEDIUM-FINE SAND, little coarse sand, slight trace of silt		4.0	201.9	4	6	_	S2	1.3 [65]	3.0	silt, tra Yellowi	ce coarse sar ish brown, C0	nd DARSE-FINE SAND, tr		
Medium dense, greyish brown, FINE SAND, trace medium sand Nedium dense, greyish brown, FINE to MEDIUM-FINE SAND, little-trace silt, trace coarse sand from 8.0' Medium dense, greyish brown and yellowish brown, FINE SAND, trace silt GLACIAL FLUVIAL- Nedium dense, greyish brown and yellowish brown, FINE SAND, trace silt GLACIAL FLUVIAL- Medium dense, greyish brown, FINE SAND, little silt The same of the sam	5 —			7	7	1			5.0	FINES	SAND, little sil	t		
Medium dense, greyish brown, FINE to MEDIUM-FINE SAND, little-trace silt, trace coarse sand from 8.0' Medium dense, greyish brown and yellowish brown, FINE SAND, trace silt -GLACIAL FLUVIAL- 8 7 8 66* 1.0 [50]						8	S3	1.1 [55]	7.0	Mediur	n dense, grey	rish brown, FINE SAND), trace medium sand	0.
silt, trace coarse sand from 8.0' S5				6		Ü	84	1 2 [60]	7.0	Mediur	n dense. arev	rish brown. FINE to ME	DIUM-FINE SAND. little-trace	0:0
S5 0.8 [40] Medium dense, greyish brown and yellowish brown, FINE SAND, trace silt -GLACIAL FLUVIAL- 8 7 S6* 1.0 [50] Medium dense, yellowish brown, FINE SAND, little silt 7 Vindicates sample submitted to lab for analysis 8 5 S7 0.9 [45] Loose, greyish brown, MEDIUM-FINE SAND, little-trace coarse sand 5 6 S8 0.6 [30] Loose, greyish brown, MEDIUM-FINE SAND, little coarse sand, slight trace of silt				ا	•	8		1.2 [00]	9.0				*	0:/
-GLACIAL FLUVIAL- 8	10 —	-			5		S5	0.8 [40]	3.0	Mediur	n dense, grey	rish brown and yellowis	h brown, FINE SAND, trace silt	
8 7 86* 1.0 [50] Medium dense, yellowish brown, FINE SAND, little silt * indicates sample submitted to lab for analysis S7 0.9 [45] Loose, greyish brown, MEDIUM-FINE SAND, little-trace coarse sand Loose, greyish brown, MEDIUM-FINE SAND, little coarse sand, slight trace of silt						7			11.0					// 6: 7
8 7 86* 1.0 [50] Medium dense, yellowish brown, FINE SAND, little silt * indicates sample submitted to lab for analysis S7 0.9 [45] Loose, greyish brown, MEDIUM-FINE SAND, little-trace coarse sand Loose, greyish brown, MEDIUM-FINE SAND, little coarse sand, slight trace of silt												-CLACIAL FIL	ΙΛΙΔΙ -	0.
Medium dense, yellowish brown, FINE SAND, little silt * indicates sample submitted to lab for analysis Solution 16.0 * indicates sample submitted to lab for analysis Loose, greyish brown, MEDIUM-FINE SAND, little-trace coarse sand Loose, greyish brown, MEDIUM-FINE SAND, little coarse sand, slight trace of silt												-GLACIAL I LO	IVIAL-	0
Medium dense, yellowish brown, FINE SAND, little silt * indicates sample submitted to lab for analysis Solution 16.0 * indicates sample submitted to lab for analysis Loose, greyish brown, MEDIUM-FINE SAND, little-trace coarse sand Loose, greyish brown, MEDIUM-FINE SAND, little coarse sand, slight trace of silt				8					14.0					0//
* indicates sample submitted to lab for analysis Solution 18.0 Loose, greyish brown, MEDIUM-FINE SAND, little-trace coarse sand Loose, greyish brown, MEDIUM-FINE SAND, little coarse sand, slight trace of silt	15 —					7	S6*	1.0 [50]	16.0	Mediur	n dense, yello	owish brown, FINE SAN	ND, little silt	T
5 S7 0.9 [45] Loose, greyish brown, MEDIUM-FINE SAND, little-trace coarse sand 5 S8 0.6 [30] Loose, greyish brown, MEDIUM-FINE SAND, little coarse sand, slight trace of silt										* indica	ates sample s	ubmitted to lab for anal	ysis	0/0
5 S7 0.9 [45] Loose, greyish brown, MEDIUM-FINE SAND, little-trace coarse sand 5 S8 0.6 [30] Loose, greyish brown, MEDIUM-FINE SAND, little coarse sand, slight trace of silt				8	3				18.0					
5 6 4 S8 0.6 [30] Loose, greyish brown, MEDIUM-FINE SAND, little coarse sand, slight trace of silt						5	S7	0.9 [45]		Loose,	greyish brow	n, MEDIUM-FINE SAN	ID, little-trace coarse sand	
6 S8 0.6 [30] Loose, greyish brown, MEDIUM-FINE SAND, little coarse sand, slight trace of silt	20 —					5			20.0					
6 S8 0.6 [30] Loose, greyish brown, MEDIUM-FINE SAND, little coarse sand, slight trace of silt														0/6
o or sint				5	6		S8	0.6 [30]	22.0		greyish brow	n, MEDIUM-FINE SAN	ID, little coarse sand, slight trace	//
					7	6			24.0	OI SIIL				
5 25.0	25 —	-		5					25.0					
6 S9 0.9 [45] Medium dense, greyish brown-dark greyish brown, MEDIUM-FINE SAND, some coarse sand, trace silt						a	S9	0.9 [45]	07.0				brown, MEDIUM-FINE SAND,	0/
Bottom of Exploration @ 27.0 ft (El. 178.9)						J			21.0		Bott	om of Exploration @ 2	7.0 ft (El. 178.9)	<u> </u>
AND CONTROLL AND C			<u>.</u>					0011508 5		<u> </u>	NON OCT			
Identification COHESIVE SOILS NON-COHESIVE SOILS Soil Descriptions Proportion Standard Split Spoon Blows/foot Consistency Blows/foot Density Capitalized Soil Name Major Component	<u>mpler</u> S			non	1		Blows			cv F				

5 - 10

11 - 24

50

WOR - Weight of Rod

WOH - Weight of Hammer

25 -

> 50

Loose

Dense

Very Dense

Medium Dense

Some

Little

Trace

20% - 35%

10% - 20%

1% - 10%

ENGLISH

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

New Hampshire

MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME **BEDFORD 13527**

DATE

Core Barrel

Not Recorded

С

NR

TB-06

31

> 60

- 30 - 60

Very Hard

Hard

WOR - Weight of Rod

WOH - Weight of Hammer

N/A BRIDGE NO.

DESCRIPTION US Route 3 Bridge Replacement **GROUNDWATER EQUIPMENT** SAMPLER **CASING CORE** DEPTH ELEV. BOTTOM BOTTOM OF CASING OF HOLE TYPE: NW TIME SIZE I.D. (in): 1.375 3

BORING NO. **B33** SHEET NO. ____1__ OF ___ STA. <u>131+55</u> OFF. RT 62 BASELINE US Route 3 ELEVATION (ft) __ 206.3 START/END _____8/3/10 / 8/3/10 DRILLER J. Pierce (NHDOT) INSPECTOR Doug Rogers

ENGLISH

DEPTH (ft)	12:45 pm	12.5	193.8	18	20	HAMMER HAMMER		140	DRILL	_ RIG	CLASSIFIER _	DRR	
(ft)	STRATUM					HAMMER	PFΔII (in\·l						
(ft)	STRATUM							30	CME 45-C	Track rig	EAST/NORTH (ft)	1037651/	160309
(ft)	STRATIIM		1	L		HAMMER	R TYPE:	Automatic	OWE TO C	Tracking	LAST/NORTH (II)	10070017	1
- 0 —	DEPTH	CHANGE (ft) ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)		FIELD) CLASSIF	ICATION A	AND REMARKS		STRA SYM
	0.4	205.9	2 2 2	S1	1.5 [75]	0.0	Very lo	rown, fibrous lose, dark yell trace mediun	owish brown	n, FINE SAN	ID, little-trace silt, trace	ce fine	
			4 5 4	S2 3	1.5 [75]	2.0	Loose, little sil	dark yellowis t, over yellowi	h brown w/ t ish brown, F	-FILL- traces of dar FINE SAND,	k greyish brown, FIN trace medium sand	IE SAND,	
5 —	4.4	201.9	3 3 4	S3	1.1 [55]	4.0	∖greyish	brown fine s greyish brow	and		e silt, occasional pock		0:1
			2 3 4	S4 7	1.0 [50]	6.0		greyish brow E SAND, trace		y SILT, over	, greyish brown, MEC	DIUM-FINE	0.
			4 5 6	S5*	1.4 [70]	8.0	Mediur brown		rish brown, F	FINE SAND,	little silt, w/ occasion	nal yellowish	0:
10 —						10.0			-GL/	ACIAL FLUV	/IAL-	-	0./0./0./0./
15 —			6 8 9	S6 7	0.8 [40]	13.0	Mediur trace g		rish brown, N	MEDIUM-FIN	NE SAND, little coars	e sand, -	// 0://
			9 9 7	S7	0.6 [30]	18.0	Mediur sand, I	n dense, grey ittle-trace silt	vish brown, N	MEDIUM-FIN	NE SAND, little-trace	coarse	/0/0/0/0
20 —				6		20.0		Bott	tom of Explo	ration @ 20	0.0 ft (El. 186.3)		
- 25 —	Idontifica	tion			COHESIV	E SOIL S	* indica	ates sample s	ubmitted to I			Proportion	
S SL T U O	Large Sp Thin Wa	d Split Spo boon (O.D. all Tube bed Piston	= 3 in)	Blows 0 - 2 - 5 - 9 -	/foot 1 4 8	Consisten Very Soft Soft Medium S Stiff	tiff 1	Blows/foot 0 - 4 5 - 10 11 - 24 25 - 50	Density Very Loose Loose Medium De Dense	Ca Lo So ense Lit	bil Descriptions apitalized Soil Name ower Case Adjective ome tttle race	Proportion Major Comp 35% - 50% 20% - 35% 10% - 20% 1% - 10%	
	Auger FI			16 -		Very Stiff		> 50	Very Dense	I	-		

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

New Hammshire

SAMPLER

EQUIPMENT

PROJECT NAME **BEDFORD 13527** DESCRIPTION US Route 3 Bridge Replacement

GROUNDWATER

Not Recorded

TB-06

NR

N/A BRIDGE NO.

CASING CORE NW

BORING NO. **B34** SHEET NO. ____1__ OF ___ STA. <u>132+50</u> OFF. <u>LT 50</u> US Route 3 BASELINE __ ELEVATION (ft) __ 204.6 DRILLER J. Pierce (NHDOT)

	1	GROUNL	JVVATE	iK	-	EQUIP	IVIEINI	SAIVIPLER	CASING	CORE		Pierce (NHE	
DATE	TIME	DEPTH	ELEV.	BOTTOM OF CASING	BOTTOM	TYPE:	(in)	S 4 275	NW				•
7/00/40	44:00	(ft)	(ft)			SIZE I.D.	(In): R WT. (lb):	1.375 140	3		INSPECTOR _	Doug Ro	
7/29/10 7/29/10	11:00 am 11:15 am	-	190.5 190.5	23.0	27.0 27		R FALL (in):	30	<u>DRILI</u>		CLASSIFIER _	DRR	
1129/10	11.15 alli	14.1	190.5	23.0	21	HAMMER		Automatic	CME 45-C	Track rig	EAST/NORTH (ft)	1037783/	16024
	STRATUM	CHANGE (ft)	BLOWS	S	SAMPLER	1		l	ı				Ī
DEPTH (ft)			PER 0.5 ft		RECOVERY (ft) [%]	RANGE		FIELD	CLASSIF	ICATION	AND REMARKS		STRA
0 -	DEPTH	ELEVATION	0.5 ft	ITOMBER	(ft) [%]								0
U	0.6	204.0	1			0.0	_ Dark b	rown, loamy 7	TOPSOIL			_	. 💥
	0.6	204.0	4	S1	1.1 [55]		Loose	, yellowish bro	wn, FINE S	AND, some-	little silt		
			3					-					\bowtie
			2	3		2.0				-FILL-			\otimes
			1				\ \/a=.1=		- h	IE CAND 1:4	41a a:14 4maaa 6:ma ama		\otimes
			1	S2	1.0 [50]		coarse		i biowii, Fiiv	NE SAIND, III	tle silt, trace fine grav	ei, irace	\otimes
				2		4.0		Jana					\otimes
			3			4.0	Yellow	ish brown and	d dark grevis	h brown, FII	NE SAND, some silt t	to "silty",	\otimes
5 -	5.0	199.6	3	S3	0.5 [25]			medium sand			•		-
Ü	0.0	100.0	4		0.0 [20]								0:1
				6		6.0							
			5 6			0.0	NA 15 1		data tanan in		landa a a Harrida Ia Ia annon		1././
			6	S4	1.1 [55]			m dense, grey JM-FINE SAN			lark yellowish brown,		0:0
				6		8.0		DIVITI IINE OAN	ים, וומטכ טטמ	ui se sai lu			11
			6			8.0]						0
			5	S5	0.9 [45]					FINE SAND,	little medium sand, t	race fine	//
			6		[]			trace coarse	sand		·		0.
10 -	-		7	7	-	10.0	-					-	-/
			8	_			Madie	m donas ara	ich brown to	dark arasi-	h brown, MEDIUM-F	INE CAND	1//
			7	S6	0.8 [40]						n brown, MEDIUM-F some fine gravel	IINE SAIND,	0.0
				8		12.0			. 50, 1100-1	12 3/1110,	John Milo gravor		11
													0.
									-Gl	ACIAL FLU\	/IAL-		·_/·/
									J L		-		<u> </u>
4-													//
15 -	1		6			15.0	1					-	
			6	S7	0.8 [40]		Mediu	m dense, grev	ish brown, N	MEDIUM-FII	NE SAND, little-trace	coarse	1//
			8				sand,				d, slight trace of silt		0.1
				9	+	17.0	-						
													1//
			5			18.0	1						0:
			4	S8	0.5 [25]		١		MEDULI	EINIE OAL			11/
			5		0.0 [20]		Loose,	, greyish brow	n, MEDIUM	-FINE SANL	D, trace coarse sand		0.
20 -	-			6	-	20.0	-					-	-//
													0.
													6.0
													11
			5			22.0]						0.
			6	S9	0.5 [25]		Loosa	, similar to S8.	little coarse	eand			//
			4		1.0 [20]		·	, sirillal (U S8,	, mue coarse	5 Sai IU			0.1.1
				5		24.0	-						
													1././
25 –	25.4	179.2	6			25.0	_ Grevis	h brown MFF	DIUM-FINE	SAND little-	trace coarse sand, tra	ace gravel	6.5
	25.4	179.2	7	S10	0.7 [35]			•		•	•	grator /	
			6		0.7 [33]		Stiff, 0	live and yellov		SILT, little-ti SIAL LACUS			F.Z
				6		27.0			-OLAC	L LACUS	TIMINE-		<u> </u>
								Bott	tom of Explo	ration @ 27	7.0 ft (El. 177.6)		
										-			
							<u> </u>			,			
	Identifica				COHESIVI				ESIVE SOILS		oil Descriptions	Proportion	
S		d Split Spo		Blows		Consisten	icy i	Blows/foot	<u>Density</u>		apitalized Soil Name	Major Comp 35% - 50%	
SL T	Thin Wa	ooon (O.D. all Tube	- sm)	0 - 2 -		Very Soft Soft		0 - 4 5 - 10	Very Loose Loose		ower Case Adjective ome	35% - 50% 20% - 35%	
Ü		bed Piston	1	5 -		Medium S	stiff	11 - 24	Medium De		ttle	10% - 20%	
0	Open Er	nd Rod		9 -	15	Stiff	:	25 - 50	Dense	Tr	ace	1% - 10%	
A	Auger Fl			16 -		Very Stiff		> 50	Very Dense	e			
C NP	Core Ba			31 -		Hard Very Hard		NOR - Weight			ENGL	ISH	

Very Hard

> 60

WOH - Weight of Hammer

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

- 15

30

60

-

Stiff

Hard

Very Stiff

Very Hard

25 -50

WOR - Weight of Rod

WOH - Weight of Hammer

> 50

Dense

Very Dense

Trace

1% - 10%

ENGLISH

9

16

31

> 60

0

NR

TB-06

Open End Rod

Auger Flight

Core Barrel

Not Recorded



PROJECT NAME **BEDFORD 13527** N/A BRIDGE NO. US Route 3 Bridge Replacement DESCRIPTION

GROUNDWATER EQUIPMENT SAMPLER **CASING CORE** TYPE NW BOTTOM BOTTOM OF CASING OF HOLE DEPTH ELEV. DATE TIME SIZE I.D. (in): 1.375 (ft) (ft) 3

BORING NO. **B35** SHEET NO. ____1__ OF ___ STA. <u>132+63</u> OFF. RT 55 BASELINE US Route 3 ELEVATION (ft) __ 207.4 START/END _____8/3/10 / 8/3/10 DRILLER J. Pierce (NHDOT) Doug Rogers INSPECTOR _

0/0/40	10.00	(11)	` '	15	45.0	HAMMEE	R WT. (lb):	140	9011	- DIO	INSPECTOR _	Doug No	
8/3/10	10:00 am	-	191.6	15	15.8		. ,	30	<u>DRILL</u>	<u>RIG</u>	CLASSIFIER _	DRF	₹
8/3/10	10:15 am	15.8	191.6	15	15.8	HAMMER	R FALL (in):	Automatic	CME 45-C	Track rig	EAST/NORTH (ft)	1037687	/16020 [°]
			<u>_</u>	1			CITPE:	Automatic			(ii)		T
DEPTH (ft)	DEPTH	CHANGE (ft) ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVER	DEPTH Y RANGE (ft)		FIELD	CLASSIF	ICATION .	AND REMARKS		STRA
0 -	DEI 1111	LLLWITTON		ļ	(ft) [%]	0.0							
	0.4	207.0	2			0.0	Dark_b	rown, fibrous	to loamy TO	PSOIL		/	· 👯
			4	S1	0.4 [20]								$\otimes \otimes$
			5 _							-FILL-			\otimes
			5			2.0							\otimes
			5			2.0	Looco	dark vallowie	h brown and	l dark arovic	h brown, MEDIUM-F	INE SAND	
			3	S2	1.0 [50]						llowish brown, MEDIU		\otimes
			5				SAND	acc graver, ac	100 000100 00	aria, over ye	ilowion brown, ividan	SIVI I IIVE	
			8			4.0	1	h brown MEC	DILIM-FINE S	SAND some	e-little silt, over yellow	ish brown	\otimes
			8			1.0					e silt, occasional pocl		
5 —	5.0	202.4	10	S3	1.2 [60]			n brown fine s		o, 12, co	o one, ocodororiai poo	, , , , , , , , , , , , , , , , , , ,	<u> </u>
			10				Yellow	ish brown, ME		SAND			1././
			7			6.0		,					\\(\frac{1}{2}\)
			8			0.0	l						1././
			6	S4	1.1 [55]						FINE SAND, little-trac	e siit, over	\\(\frac{1}{2}\)
			7				, ,	ellowish brown	n and greyisr	i brown, siity	FINE SAND		1././
			5			8.0							6.0
			6				N /1: · · ·	m donos =====	ioh braus f	no condicol	II T to cilty FINIT CAN	Б	1//
			6	S5	1.4 [70]						LT to silty FINE SAN	D,	6.0
			8			10.0	occasi	onal dark yello	UMO.IG LIGIMU	HOUGE			1//
10 —						10.0							To: .
													11
													0:0
									-GLA	ACIAL FLU\	/IAL-		1//
													0:.
													//
			7			13.0							0:
			7	S6	0.9 [45]	1	Mediu	m dense, grev	ish brown, N	/EDIUM-FI	NE SAND, trace coars	se sand,	1//
			9		0.0 [-0]	1	trace s		,		,	,	0.
15 —			10			15.0							_///
						1							9.
													7
													10.7.
													(6:5
													1//
			5			18.0							6:0
			4			1	Locas	groviah brow	n MEDILINA	EINIE CANIE) little coores cond to	raco araval	11/
			6	S7	0.6 [30]		trace s		ıı, ıvı⊏DIUIVI-	I IINE SAINL), little coarse sand, to	iace gravel,	6:0
00			10			20.0	li ace s						1/1
20 —							1						√ o∷.'
													11/
			7			21.0							0:
			9	S8	0.6 [30]		Mediu	m dense, grev	ish brown ar	nd dark vello	wish brown, MEDIUN	M-FINE	//
			11		0.0 [30]	1					vel, little-trace silt		0
			9			23.0							//
								Bott	tom of Exploi	ration @ 23	3.0 ft (El. 184.4)		
								2011			(=::		
25 —						1							
						1							
						1							
Sampler	Identifica	ation	1		COHESIV	E SOILS	<u> </u>	NON-COH	ESIVE SOILS	Sc	oil Descriptions	Proportion	
S		d Split Spo	on	Blows		Consisten	cy I I	Blows/foot	<u>Density</u>		apitalized Soil Name	Major Com	ponent
		ooon (O.D.		0 -		Very Soft	_ '	0 - 4	Very Loose		wer Case Adjective	35% - 50%	
Т	Thin Wa			2 -	4	Soft		5 - 10	Loose	I	ome	20% - 35%	
U		bed Piston	ı	5 -		Medium S		11 - 24	Medium De		ttle	10% - 20%	
Ω	Onen Er	nd Rod		l a _	15	Stiff	1 1	25 - 50	Dense	l Tr	ace	1% - 109	/_

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

- 15

30

60

-

Stiff

Hard

Very Stiff

Very Hard

25 - 50

WOR - Weight of Rod

WOH - Weight of Hammer

> 50

Dense

Very Dense

Trace

1% - 10%

ENGLISH

9

16

31

> 60

0

NR

TB-06

Open End Rod

Auger Flight

Core Barrel

Not Recorded



PROJECT NAME BEDFORD 13527 BRIDGE NO. N/A

US Route 3 Bridge Replacement DESCRIPTION **GROUNDWATER EQUIPMENT** SAMPLER **CASING CORE** TYPE NW BOTTOM BOTTOM OF CASING OF HOLE DEPTH ELEV. DATE TIME SIZE I.D. (in): 1.375 (ft) (ft) 3

		(11)	(11)	01 0/101110		OIZL I.D.	• •	1.070			INSPECTOR	Doug No	-
3/30/10	11:30 am	Dry		10.0	12.0		R WT. (lb):	140	DRILL RIG		CLASSIFIER	DRF	₹
3/30/10	11:45 am	Dry		10.0	12.0	HAMMER	R FALL (in):	30					
		 				HAMMER	R TYPE:	Automatic	CME 45-C T	rir	EAST/NORTH (ft)	1037798/	15999
	OTD 4 T:	01145105 15	DI OWA		CA145:								
EPTH	STRATUM	CHANGE (ft)	BLOWS	SAIVIPLE	SAMPLER	DEPTH		בורו ה) CI ASSITIO 47	LION	AND DEMARKS		STRA' SYMI
(ft)	DEPTH	ELEVATION	PER 0.5 ft	NUMBER	RECOVER (ft) [%]	Y RANGE (ft)	1	FIELL	OLASSIFICA I		AND REMARKS		SYME
0 -			0.5 10		(11) [70]	(11)							
•		0040						-ASPHAL	T- (cored w/ 6" di	iamono	d and submitted to lab))	
	0.6	204.9				0.6							XXX
							Dark y	ellowish brow	n and dark grevish	n brow	n, gravelly COARSE-F	INE	
				S1*	1.8 [90]		SANĎ.	trace silt, occ	casional small pied	ce of a	sphalt		\times
										ILL-			$\otimes \otimes$
						2.6			• '				\otimes
	2.9	202.6		S2A*	0.9 [100]	2.6	Similar Similar	<u>to S1 </u>				/	/
	3.5	202.0		02/1	0.0 [.00]	3.5				own an	d brownish grey, silty	FINE	_ XXX
	0.0	202.0		S2B*	1.1 [100]	3.5	\SAND,	trace mediur	n sand			/	' O: · /
				326	1.1[100]	4.6	Dark v	ellowish brow	n, fine sandy SIL7	Γ			//
_						4.0	,		,				0
5 —			4			5.0	i						7//
			5				Mediur	n dense, dark	vellowish brown.	FINE	SAND, little silt, trace	medium	6:0
			6	S3	0.9 [45]						reyish brown, silty FIN		1././
			1				over or	evish brown	COARSE-FINE S	SAND	- cy.c 2. c, cy	_ 0,,	(2:0
			3	3		7.0	Ovcigi	Cylori bi Owir,	OOAROL-I IIVL O				10.
									01.40141				1/6
									-GLACIAL	. FLU\	/IAL-		0:.
			6			8.0							1//
			9				Madie	n donos are:	ich brown MEDII	IN / IN	JE CAND come occur	no oond	[o:."
			9	S4	1.3 [65]				isii biown, iviediu	יון ד-ועוע	NE SAND, some coars	e sano,	1././
				,			trace s	IIΤ					
10 -			_ 8	^——		10.0							10,/
			5			10.0							//0
			5	S5	1.1 [55]		Modius	n donoo arov	ich brown MEDII	IN A EIN	NE SAND, trace coars	o cond	10.
			6		[]		IVICUIUI	ii uciise, giey	isii biowii, wildi	וו ו-ועוכ	NE SAIND, ITAGE COAIS	5 Sailu	//
			5	5		12.0							0:.
								Pott	om of Exploration	@ 13	0.0 ft (El 102 E)		
								DOLL	om or Exploration	W 12	o it (Li. 195.5)		
15 -													
-													
20 -													
20													
25 -													
	L	<u> </u>		+	00::==:	<u> </u>	<u> </u>	NG	=0" /= CO" =				
<u>ampler</u>	Identifica				COHESIV	'E SOILS		NON-COH	ESIVE SOILS		oil Descriptions	Proportion	
S	Standard	d Split Spo	on	Blows	/foot	Consisten	cy E	Blows/foot	<u>Density</u>	Ca	apitalized Soil Name	Major Com	ponent
SL	Large Sp	ooon (O.D.	= 3 in)	0 -	1	Very Soft		0 - 4	Very Loose	Lo	wer Case Adjective	35% - 50%	6
Т	Thin Wa	all Tube	•	2 -	4	Soft		5 - 10	Loose	So	ome	20% - 35%	6
Ú		bed Pistor	1	5 -	8	Medium S	tiff /	11 - 24	Medium Dense	1	itle	10% - 20%	
Ô	Onen Fr			ا م	15	Stiff		25 - 50	Dense		ace	1% - 10%	

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

S:\GINTW\P

TB-06

Т

U

0

С

NR

Thin Wall Tube

Open End Rod

Auger Flight

Core Barrel

Not Recorded

Undisturbed Piston

2

5

9 - 15

16

31

> 60

8

30

Soft

Stiff

Hard

Medium Stiff

Very Stiff

Very Hard



PROJECT NAME **BEDFORD** 13527 N/A BRIDGE NO. US Route 3 Bridge Replacement DESCRIPTION

GROUNDWATER EQUIPMENT SAMPLER **CASING CORE** TYPE: NW BOTTOM BOTTOM OF CASING OF HOLE DEPTH ELEV. DATE SIZE I.D. (in): 1.375 (ft) (ft) 3 7/28/10 11:05 am 193.7 HAMMER WT. (lb): 140 DRILL RIG 9.9

BORING NO. **B37** SHEET NO. _ OF_ OFF. STA. US Route 3 BASELINE _ ELEVATION (ft) _ 203.6 7/28/10 / 7/28/10 START/END __ DRILLER J. Pierce (NHDOT) Doug Rogers INSPECTOR CL ACCITIED

20% - 35%

10% - 20%

ENGLISH

1% - 10%

[7/28/10	11:05 am		193.7	10.0	12		R WT. (lb):	140	DRILL RIG	CLASSIFIER	DRR	
ļ	7/28/10	11:15 am	Dry		10	12		R FALL (in):	30	CME 45-C Track rig		1037917/	
ļ				1	1		HAMMER	K TYPE:	Automatic		Z LACIANOINTITI(II)	.0010111	1
	DEPTH (ft)	STRATUM DEPTH	CHANGE (ft) ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)		FIELD	CLASSIFICATION	I AND REMARKS		STRATUM SYMBOL
•	- 0 -	0.4	203.2	2 3 4	S1	0.7 [35]	2.0	Loose,	dark yellowis		L NE SAND, little fine grav own, FINE SAND, some		
				4 2 3	S2	0.7 [35]	4.0	Loose,	dark greyish sh brown, FIN	brown, FINE SAND, s NE SAND, some silt to -FILL-	ome silt, trace gravel, ov "silty"	/er	
-	- 5 -	4.3	199.3	5 4 6	S3	1.2 [60]	4.0	Loose, brown,	yellowish bro		o, little silt, trace coarse silty FINE SAND, over e sand		0::,0:
				5 6 7	S4*	1.1 [55]	6.0	Mediur	n dense, grey trace silt	rish brown w/ traces of	yellowish brown, MEDI	UM-FINE	0: ,0:
				6	6		8.0			-GLACIAL FLU	JVIAL-		1/.//
				4 4 5	S5	0.8 [40]		of silt	h brown, MEI	DIUM-FINE SAND, sor	ne-little coarse sand, sli	ght trace	0:00
•	- 10 -			4 4 5 7	S6	1.0 [50]	10.0	Loose,	greyish brow trace coarse		owish brown, MEDIUM	-FINE	• • • • • • • • • • • • • • • • • • •
				'			12.0		5.4	· · · · · · · · · · · · · · · · · · ·	10.0 (1 (5) 101.0)		1././/./
									DUL	om of Exploration @	12.011 (El. 191.0)		
	– 15 <i>–</i>												
	10												
9/20/2010 2:22:46 PM TB-06													
M													
16 PI													
:22:	- 20 -												
10 2													
)/201													
ЭРЈ													
GS.(
RIN													
звс													
빍	– 25 –												
\RO													
3527													
(D) 1;													
FOR													
PROJECTS/BEDFORD/13527/ROUTE3BORINGS.GPJ													
TS\	Sampler	Identifica	l ation	1		COHESIVI	E SOILS	 	NON-COH	ESIVE SOILS	Soil Descriptions	Proportion	1
JEC	S		d Split Spo	on	Blows		Consisten	<u>cy</u> <u>E</u>	Blows/foot		Capitalized Soil Name	Major Comp	onent
PRC	SL		ooon (O.D.		0 -		Very Soft		0 - 4		_ower Case Adjective	35% - 50%	

5 - 10

11 - 24

50

WOR - Weight of Rod

WOH - Weight of Hammer

25 -

> 50

Loose

Dense

Very Dense

Medium Dense

Some

Little

Trace

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

60

-

Hard

Very Hard

WOR - Weight of Rod

WOH - Weight of Hammer

ENGLISH

31

> 60

NR

TB-06

Core Barrel

Not Recorded



PROJECT NAME **BEDFORD 13527** N/A BRIDGE NO.

US Route 3 Bridge Replacement DESCRIPTION **GROUNDWATER EQUIPMENT** SAMPLER **CASING CORE** TYPE NW NX BOTTOM BOTTOM OF CASING OF HOLE DEPTH ELEV. DATE TIME SIZE I.D. (in): 1.375 1.875 (ft) (ft) 3

BORING NO. **B38** SHEET NO. _ OF __ STA. _ OFF. US Route 3 BASELINE _ ELEVATION (ft) _ 194.7 START/END _____7/28/10 / 7/28/10 DRILLER J. Pierce (NHDOT) Doug Rogers INSPECTOR _

	7/00/40	0.00	(11)		44.0		HAMMER	R WT. (lb):	140	5 1.07 DDILL DIO		INSPECTOR _	Doug No	
	7/28/10	2:30 pm	6.7	188.0	14.6	14.6 14.6		R FALL (in):	30	DRILL RIG		CLASSIFIER	DRR	
	7/29/10	7:50 am	10.0	184.7	14.6	14.0	HAMMER	. ,	Automatic	CME 45-C Track	k rig	EAST/NORTH (ft)	1038210/	159760
		STDATIM	CHANGE (ft)	BLOWS		SAMPLER	1		, laterilate					
	DEPTH (ft)		ELEVATION	PER	SAMPLE NUMBER	RECOVER' (ft) [%]	Y RANGE (ft)		FIELD) CLASSIFICAT	ION	AND REMARKS		STRATUM SYMBOL
	- 0 -	0.0	101.1	1			0.0	Dark q	revish brown	and dark brown, fir	ne sai	ndy TOPSOIL		### #
		0.6	194.1	1	S1	0.8 [40]							Lfibor	\sim
				2				BIOWII	ish yellow and	i yellowish brown, i SUBS-	ine s	andy SILT, occasional	i libei	~~~
				3	S2	0.2 [40]	2.0							\\\~\`\`\`
		2.5	192.2	13/0	32	0.2 [40]	2.0 2.5	Yellow	ish brown, fin	e sandy SILT, refu: PPROXIMATE BE	sal at	2.5'		\(\)
				10/0					-A	PPROXIIVIATE BEI	DRO	CK SURFACE-		
								Advan	ced hole to 5.0	0' into rock w/ 3" ro	oller b	it		
	- 5 -												_	¥//)X/
							5.0							
									-4-6-6		- 12 - 1-	th		
												tly weathered, sound [,] and black, coarse-gra	ainad	
					C1	4.8 [100]		GNFIS	SS Intruded w	/ coarse-grained G	, grey RAN	ITE from 8.7' to 9.7'.	ali leu,	
						4.6 [100]						horizontal. Foliation is	poorly	
								define	d, barely disce	ernible.			. ,	
								RQD:	4.3 / 4.8 = 90	%				
							0.0							
	– 10 –						9.8						-	-XXXX
												ey and black, coarse-g		
												ITE from 10.1-10.5' ar		
					C2	4.8 [100]						d extreme fracturing for		
									ate, where dis		ontai	. Foliation appears ste	ep to	
									4.4 / 4.8 = 92°					
							14.6							<i>X///XX/</i>
	− 15 −								Bott	om of Exploration	@ 14	1.6 ft (El. 180.1)		
σ.														
TB-06														
=														
2:22:48 PM														
2:48	- 20 -													
2:2	20													
20/2010														
0/2														
6														
Ή														
SS.G														
ING														
ЗОR														
E3E	- 25 -													
Ĭ	20													
7RC														
3527														
0,13														
ORI														
ΞP														
S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ														
SE	Sampler	Identifica				COHESIV				ESIVE SOILS		oil Descriptions	Proportion	
OJE	S		Split Spo		Blows		Consisten	<u>cy</u> l	Blows/foot	<u>Density</u>		apitalized Soil Name	Major Comp	
PR	SL T	Large Sp Thin Wa	ooon (O.D.	= 3 in)	0 - 2 -		Very Soft		0 - 4 5 - 10	Very Loose		ower Case Adjective ome	35% - 50% 20% - 35%	
≨	Ü		ılı Tube bed Piston	ı	5 -		Soft Medium S	tiff .	5 - 10 11 - 24	Loose Medium Dense		ome ttle	20% - 35% 10% - 20%	
N S	Ö	Open En		•	9 -		Stiff		25 - 50	Dense		ace	1% - 10%	
S:\		Auger FI	ight		16 -	30	Very Stiff		> 50	Very Dense				
9	C	Core Rai	rrel		31 -	60	Hard	\	VOR - Weight	of Rod		ENGL		

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

New Hampshire

PROJECT NAME **BEDFORD 13527**

NR

TB-06

Core Barrel

Not Recorded

31

> 60

Very Hard

Hard

WOR - Weight of Rod

WOH - Weight of Hammer

ENGLISH

BRIDGE NO. _

		GROUN	DWATE	R		EQUIP	MENT	SAMPLER	CASING	CORE
DATE	TINAT	DEPTH	ELEV.	воттом	воттом	TYPE:		S	NW	NX
DATE	TIME	(ft)	(ft)			SIZE I.D.	(in):	1.375	3	1.875
9/10/10	9:00 am	25.9	243.8	66.3	66.3	HAMMER	R WT. (lb):	140	DRILI	RIG
	0.00 dill 20.0 240.0 00.0					HAMMER	R FALL (in):	30	CME 45-C	
						HAMMER	R TYPE:	Automatic	CIVIE 45-C	, macking
			D1 014/6		0.4451.55	DEDTIL				

BORING NO. **B39** SHEET NO. _ __1___ OF _ STA. 122+25 OFF. RT 417 US Route 3 BASELINE ____ ELEVATION (ft) ___ 269.7 START/END _____9/7/10 / 9/10/10 DRILLER J. Pierce (NHDOT) Doug Rogers INSPECTOR _ DRR **CLASSIFIER** 0778

						HAMMER	FALL (in):	30	DRILL RIG	CLASSIFIER		KK
						HAMMER	. ,	Automatic	CME 45-C Track	K rig EAST/NORTH (f	t) <u>10370</u>	75/16077
DEPTH (ft)	STRATUM DEPTH	CHANGE (ft)	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)		FIELD) CLASSIFICATI	ON AND REMARKS		STRA SYM
- 0 -	0.4 1.1	269.3 268.6	1 2 50/0.4	S1	0.9 [64]	0.0	Dark y	-medium san	n, FINE SAND, sor d, few root fibers	me silt, little-trace fine gra	avel, trace	
- 5 -				C1	4.7 [98]		fractur GNEIS Joints/ discold shallow to 2.0'.	ately hard to hed to sound, ges. Quartz-rick fractures are ored/stained. For dipping. Sev	nard, moderately segrey-brownish greyh GRANITIC INTRI very close to closel Fractures of 50-55° verely weathered an hallow to moderate	DROCK SURFACE- vere to slightly weathere and black, coarse-medi. JSIONS from 3.1-3.3' ar y spaced and most are at 5.4' and 35° at 2.4'. And dextremely fractured zo where discernible.	im grained and 4.0-4.2'.	
- 10 —	-			C2	4.9 [102]	6.2	and bla moder shallov irregula	ack, coarse-m ately closely s v dipping. Foli	edium grained, GN paced. Fractures o ation is mostly sha 0.1' of core picked	sound to moderately frac IEISS. Joints/fractures at f 35-40° at 8.1' and 8.4'. llow to moderate, occasion up from C1.	re close to Others are	
- 15 —				С3	4.6 [96]	11.0	graine and sh occasi	d, GNEISS. Jo	oints/fractures are i Foliation is modera ir.	ared, grey and black, coa moderately close to close ate, where discernible ar	ely spaced	
20 —				C4	3.9 [81]	15.8 15.8	graine and sh left in l	d, GNEISS. Jo allow dipping.	oints/fractures are of Foliation is mainly or retrieve after seve	grey and black, coarse- close to moderately close shallow. Approximately of aral attempts.	ely spaced	
				C5	4.4 [119]	20.6 20.6 24.3	Joints/ Approx was le	fractures are	moderately closely f core was retrieved present run.	urse-grained, GNEISS. spaced and shallow dipp d from C4, yet additional	oing. 0.4' of core	
25 —				C6	4.8 [112]		GNEIS shallov Additio	SS. Joints/frac v dipping. Foli	tures are moderate ation is mostly irrec re was picked up fro	grey and black, coarse- ly close to closely space gular, moderate where di om previous run.	d and	
Sampler S SL T U O	Large Sp Thin Wa	d Split Spo boon (O.D. Ill Tube bed Piston Id Rod	= 3 in)	Blows/ 0 - 2 - 5 - 9 - 16 -	1 4 8 15	28.6 28.6 28.6 E SOILS Consistend Very Soft Soft Medium Si Stiff Very Stiff	iiff 2	NON-COHI Blows/foot 0 - 4 5 - 10 11 - 24 25 - 50	ESIVE SOILS Density Very Loose Loose Medium Dense Dense Very Dense	Soil Descriptions Capitalized Soil Name Lower Case Adjective Some Little Trace	Proportion Major Co 35% - 5 20% - 3 10% - 2 1% - 6	 omponent 50% 35% 20%

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

TB-06

S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010 2:22:50 PM

TB-06

65



BORING NO. **B39**SHEET NO. __2 OF __3

STA. __122+25 OFF. _RT 417

BASELINE ___US Route 3

PROJECT NAME BEDFORD 13527 BRIDGE NO. US Route 3 Bridge Replacement DESCRIPTION 269.7 **ELEVATION (ft)** TRATUM CHANGE (ft) SAMPLER BLOWS DEPTH SAMPLE STRATUM SYMBOL DEPTH FIELD CLASSIFICATION AND REMARKS DEPTH **ELEVATION** (ft) [%] 30 Hard, fresh, sound, grey and black, coarse-grained, GNEISS. Becomes less coarse from 31.6'. Joints/fractures are moderately closely spaced and C7 4.8 [100] shallow dipping. Foliation is irregular, moderate to steep where discernible. RQD: 4.8 / 4.8 = 100% 33.4 33.4 Hard, fresh, sound to slightly fractured, grey and black, coarse-grained, 35 GNEISS. Joints/fractures are close to moderately closely spaced and C8 4.4 [92] shallow dipping. Foliation appears to be shallow to moderate, where discernible. Approximately 0.4' of core left in hole. RQD: 3.9 / 4.8 = 81% 38.2 38.2 Hard, fresh to very slightly weathered, sound to slightly fractured, grey and black, coarse-grained, GNEISS. Joints/fractures are close to moderately 40 closely spaced and shallow dipping. Joint surface at 41.9' is moderately C9 4.9 [111] weathered. Foliation is shallow to moderate. Additional 0.4' of core picked up from previous run. RQD: 4.4 / 4.4 = 100% 42.6 42.6 Hard, very slightly weathered to fresh, moderately fractured to sound, grey and black, coarse-grained, GNEISS. Joints/fractures are close to moderately C10 4.8 [100] 45 closely spaced and shallow dipping. Foliation is shallow dipping and moderately well-defined. RQD: 4.3 / 4.8 = 90% 47.4 47.4 Hard, very slightly weathered to fresh, sound to moderately fractured, grey and black, medium-grained, GNEISS. Intruded w/ coarse-grained, quartz-rich GNEISSIC GRANITE. Joints/fractures are moderately close to C11 4.7 [98] 50 closely spaced and shallow dipping. Foliation is mainly non-existent, shallow where discernible RQD: 4.1 / 4.8 = 85% 52.2 52.2 Hard-very hard, fresh, sound to slightly fractured, grey and black, medium to coarse grained, GNEISS. Intruded w/ coarse-grained, quartz-rich GNEISSIC GRANITE throughout the run. Joints/fractures are moderately close to C12 4.7 [100] closely spaced. Fractures of 60-65° at 55.9' and 50° at 56.0'. All others are 55 shallow dipping. Foliation is shallow to moderate, where discernible RQD: 4.3 / 4.7 = 91% 56.9 56.9 Hard, very slightly weathered to fresh, slightly fractured to sound, grey and black, coarse-grained, GNEISS. Intruded w/ coarse-grained GRANITE from start of run to approximately 57.9'. Zone of extreme fracturing w/ high-angle fractures from 57.4' to 57.7'. Joints/fractures are moderately close to closely C13 4.8 [102] spaced. Fracture of 45° at 58.4'. All others are shallow dipping. Minor cracks in core surface at 59.0'. Traces of calcite in the form of stringers exist. 60 Foliation is moderate to shallow. RQD: 4.1 / 4.7 = 87% 61.6 61.6 Hard, very slightly weathered to fresh, sound to slightly fractured, grey and black, coarse-grained, GNEISS. Transitions to a GNEISSIC GRANITE from approximately 62.6' to end of run. Joints/fractures are moderately close to C14 4.8 [102] closely spaced and shallow dipping w/ exception of 45° fracture at 65.6'. Foliation is shallow to moderate within the gneiss zone.

RQD: 4.1 / 4.7 = 87%

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION



BORING NO. **B39** SHEET NO. 3 OF _ US Route 3

MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION STA. 122+25 OFF. RT 417 PROJECT NAME **BEDFORD 13527** N/A BRIDGE NO. _ BASELINE _ US Route 3 Bridge Replacement DESCRIPTION 269.7 ELEVATION (ft) STRATUM CHANGE (ft) BLOWS PER 0.5 ft SAMPLER RECOVERY (ft) [%] DEPTH RANGE (ft) SAMPLE NUMBER STRATUM SYMBOL DEPTH FIELD CLASSIFICATION AND REMARKS DEPTH ELEVATION 66.3 TB-06

		C15	3.8 [100]		Hard, fresh, moderately fractured to sound, grey and black, coarse-grained, quartz-rich, GNEISS. Intruded w/ PEGMATITE from 68.2' to 68.8'. Joints/fractures are close to moderately closely spaced and shallow dipping. Foliation is non-discernible. RQD: 3.4 / 3.8 = 89%	
- 70 -				70.1	Bottom of Exploration @ 70.1 ft (El. 199.6)	
- 75 -	-					
- 80 -						
- 85 - 90- <u>81</u>						
TB-06 S.YGINTWIPROJECTS/BEDFORD/13827/ROUTE3BORINGS.GPJ 9/20/2010 2:22:50 PM TB-06						
352/ACOTESBOAR 	-					
B-06 S:\GINTW\PROJECTS\B 						

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION



MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME BEDFORD 13527

N/A BRIDGE NO.

US Route 3 Bridge Replacement DESCRIPTION **GROUNDWATER EQUIPMENT** SAMPLER **CASING** CORE DEPTH ELEV. BOTTOM BOTTOM TYPE NW NX

BORING NO. **B40** SHEET NO. OF 120+26 OFF. RT 240 STA. _ US Route 3 BASELINE _ ELEVATION (ft) _ START/END __ 8/31/10 / 9/7/10 DRILLER J. Pierce (NHDOT) **Doug Rogers DRR** 1037047/160985

35% - 50%

20% - 35% 10% - 20%

1% - 10%

ENGLISH

Major Component

STRATUM SYMBOL

	DATE	TIME	DEPTH	ELEV.		воттом _Б	TIFE.		3	INVV	INA	DIVILLELIX	
	DAIL	IIIVIL	(ft)	(ft)	OF CASING	OF HOLE	SIZE I.D.	(in):	1.375	3	1.875	INSPECTOR _	Doug Ro
	9/7/10	8:30 am	30.4	231.1	48.2	48.2	HAMMER	R WT. (lb):	140	DRILL	RIG	CLASSIFIER _	DRR
	9/9/10	8:00 am	30.1	231.4	None	63.3	HAMMER	R FALL (in):	30	·			
							HAMMER	R TYPE:	Automatic	CME 45-C	, macking	EAST/NORTH (ft)	1037047/
	DEPTH (ft)		CHANGE (ft)	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVER' (ft) [%]	DEPTH RANGE (ft)		FIELD) CLASSIF	ICATION	AND REMARKS	
	- 0 -	0.2	261.3	3	 		0.0	⊃ Dark h	rown, fibrous	TOPSOIL			
				5	S1	0.5 [50]	1.0				ND little gra	vel, trace coarse-med	dium sand
		1.0	260.5	12/0			1.0	occasi	onal root, fiber -A	r PPROXIMA	-SUBSÖIL TE BEDRO	CK SURFACE-	/
	- 5 -				C1	4.6 [96]	5.8	fractur extrem high-ai comple	ed to sound, o e fracturing o	grey and blace ontaining mu to 3.5'. Sud	ck, medium- ultiple close	erately weathered, ext grained, GNEISS. Zo and very closely spac ss of drilling fluid fron	one of ced
	— 10 <i>—</i>				C2	4.7 [98]	5.8	and bla modera coarse to clos non-dis	ack, medium-ç ately severe to -grained, GNE	grained, QU/ o severely wo EISSIC GRA ractures of 5	ARTZ-BIOT eathered, ex NITE. Joint	sound to slightly frac ITE GNEISS to 9.11. tremely to moderatel' s/fractures are mode d 40° at 10.0'. Foliati	Overlies a y fractured, rately close
	— 15 <i>—</i>				C3	4.8 [102]	10.6 10.6 15.3	and pir Transit very cli at 11.8 stained occasion modera from C	nkish grey to clions into a Gitose to closely it. Extremely fit w/ few extending cracking ately well to w	grey and black NEISS from spaced and ractured zon iding up to 1 of core surfatell-defined a	ck, coarse-g approximate shallow dip the from 12.1 beyond the ace from sta	derately to slightly fractional, GNEISSIC Goly 12.8'. Joints/fractuping w/ exception of 5' to 12.4'. All joint sure fracture. Minor pittir of run to 12.4'. Foldditional 0.1' of core	RANITE. ures are of fracture faces are ng and iation is
2:22:52 PM TB-06					C4	4.6 [96]		GNEIS shallow stained hole.	S. Joints/frac v dipping w/ e	tures are mo xception of 7 well-defined	oderately clo 70°. Most all	and black, coarse-gr se to closely spaced joint surfaces are m Approximately 0.2' of	and oderately
55	- 20 -						20.1						-
010					C5	4.7 [102]		and bla Multipl 23.3' a at 24.1 core pi	ack, coarse-gr e 75-80° fract nd all others a	rained, GNE tures from 2 are shallow o ained. Foliati C4.	ISS. Joints/f 0.6' to 21.2' dipping. All j	erately to slightly fractractures are closely s , 55° fracture at 24.0' oint surfaces are roug to moderate. Addition	spaced. ', 40° at gh, surface
S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2	- 25 -				C6	4.9 [104]	24.7	slightly From a severe end of fractur where	rfractured, greapproximately -moderately s run. Multiple	ey-greenish 27.7' becomevere weath high-angle fi 7.2' and 25.0	grey and bla nes muscovi ering and ex ractures pre	erely weathered, mod ack, coarse-grained, (te-rich and schistose dreme fracturing fron sent within this zone. .7' exist. Foliation is r	GNEISS. . Zone of n 27.7' to . Other
STS	Sampler	Identifica	ation	•		COHESIV	E SOILS			ESIVE SOILS	Sc	oil Descriptions	Proportion
Ä	S		d Split Spo	on	Blows		Consisten	су <u>Е</u>	Blows/foot	Density		apitalized Soil Name	Major Comp
УRC	SL		poon (O.D.	= 3 in)	0 -		Very Soft		0 - 4	Very Loose	I	wer Case Adjective	35% - 50%
Α×	Т	Thin Wa			2 -		Soft		5 - 10	Loose	I	ome	20% - 35%
Ę	U		bed Piston	١	5 -		Medium St		11 - 24	Medium De	II	ttle	10% - 20%
9	0	Open Er			9 -		Stiff		25 - 50	Dense		ace	1% - 10%
S	A	Auger Fl			16 -		Very Stiff Hard		> 50 VOR - Weight	Very Dense			
9	C.	LOTE Ha	LIEI		1 31 -	nu	Hard	, 1/	VUK - WADIANT	or Roa		ELIC	IOLI

Core Barrel

Not Recorded

NR

TB-06

31

> 60

Very Hard

Hard

WOR - Weight of Rod

WOH - Weight of Hammer

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION



BORING NO. B40

SHEET NO. __2 OF __2

STA. __120+26 OFF. _RT _240

BASELINE ____US Route 3

PROJECT NAME BEDFORD 13527

US Route 3 Bridge Replacement

TB-06

9/20/2010 2:22:53 PM

S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ

TB-06

65

US Route 3 Bridge Replacement DESCRIPTION 261.5 **ELEVATION (ft)** STRATUM CHANGE (ft) SAMPLER BLOWS DEPTH SAMPLE STRATUM SYMBOL DEPTH RECOVER' (ft) [%] FIELD CLASSIFICATION AND REMARKS DEPTH FI EVATION (ft) 29.4 29.4 30 Hard, very slightly weathered, slightly fractured to sound, grey-greenish grey and black, coarse-grained, GNEISS. Isolated zones of increased schistosity exist. Joints/fractures are close to moderately closely spaced. Fracture of C7 4.6 [100] 45° at 32.9'. Others are all shallow dipping. Joint surface at 32.0' is heavily stained. Foliation is irregular. RQD: 4.4 / 4.6 = 96% 34.0 34.0 35 Hard, very slightly weathered to fresh, slightly fractured to sound, grey-greenish grey and black, coarse-grained, GNEISS. Frequent zones of increased schistosity exist throughout the run. Joints/fractures are close to 4.8 [100] C8 moderately closely spaced. Fractures of 60-65° at 36.9' and 37.1', 65-70° at 34.9'. Others are shallow dipping. Foliation is mostly moderate, becomes irregular near end of run. RQD: 3.9 / 4.8 = 81% 38.8 38.8 Hard, fresh, sound to slightly fractured, grey and black w/ traces of green, 40 coarse-grained, GNEISS. Frequent zones of increased schistosity exist from 40.3' to end of run. Coarse-grained GNEISSIC GRANITE from 38.8' to C9 4.7 [102] 39.6'. Joints/fractures are moderately closely spaced. Fracture of 65° at 40.8'. All others are shallow dipping. Foliation is moderate, where discernible. RQD: 4.5 / 4.6 = 98% 43.4 43.4 Hard, very slightly weathered, moderately to slightly fractured, grey and black, coarse-grained, GNEISS. Intruded w/ PEGMATITE from 44.4' to 46.6'. Zones of severe weathering and extreme fracturing from 44.1' to 44.5' and 45.0' to 45.2'. Joints/fractures are very close to closely spaced. 45 C10 4.4 [92] Near-vertical fracture within the pegmatite extends from 44.7' to 45.2'. Foliation is irregular, barely discernible within the gneiss. Approximately 0.4' of core left in hole RQD: 2.2 / 4.8 = 46% 48.2 48.2 Moderately hard-hard, very slightly weathered to fresh, sound to slightly fractured, grey and black, coarse-grained, GNEISSIC SCHIST. Zone of moderately severe weathering and extreme fracturing from 49.5' to 49.8' and 51.0' to 52.1'. Joints/fractures are moderately close to closely spaced. 50 C11 3.3 [79] Fractures of 55° at 49.3' and 60° at 49.5 and 49.7'. Vertical fracture from 51.0' to 51.4'. Foliation is moderate, where discernible. Approximately 0.9' of core left in hole. Inspected inner barrel catcher-replaced. Also picked up 0.4' of core from C10. RQD: 2.9 / 4.2 = 69% 52 4 Moderately hard to hard, very slightly fractured to fresh, sound, black and grey, coarse-grained, SCHISTOSE GNEISS. Foliation is steep and C12 4.7 [124] well-defined. Additional 0.9' was picked up from C11. 55 RQD: 3.6 / 3.8 = 95% 56.2 56.2 Moderately hard to hard, sound to moderately fractured, very slightly weathered to fresh, grey and black, coarse-grained, SCHISTOSE GNEISS. C13 4.8 [100] Joints/fractures are widely to closely spaced. Fracture of 50° at 56.6'. Others are shallow dipping. Foliation is well-defined, steep to moderate. RQD: 4.1 / 4.8 = 85% 60 61.0 61.0 Hard, fresh, sound, grey and black, coarse-grained, GNEISS. Foliation is C14 2.3 [100] steep to moderate and well-defined. RQD: 2.3 / 2.3 = 100% Bottom of Exploration @ 63.3 ft (El. 198.2)

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

US Route 3 Bridge Replacement

DESCRIPTION



DRILL RIG

CME 45-C Track rig

MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION PROJECT NAME BEDFORD 13527

BRIDGE NO. SAMPLER **CASING** CORE

3

1.375

140

30

Automatic

BORING NO. **B41** SHEET NO. . OF STA. <u>118+68</u> OFF. <u>RT 593</u> US Route 3 BASELINE _ ELEVATION (ft) _ 273.9 START/END ____8/17/10 / 8/24/10 DRILLER ___ J. Pierce (NHDOT) **Doug Rogers** INSPECTOR **DRR** CLASSIFIER

EAST/NORTH (ft)

1036861/160665

STRATUM

SYMBOL

	DESCI	XIF HOI	v <u> </u>	TOULC	o bridg	c i tepia	CCITICITE	
			GROUNE	OWATER	₹		EQUIP	MENT
İ	DATE	TIME	DEPTH	ELEV.	воттом	воттом	TYPE:	
	DATE	TIME	(ft)		OF CASING		SIZE I.D.	. ,
	8/24/10	8:15 am	42.2	231.7	63.3	63.3	HAMMER	
ŀ	9/9/10	8:30 am	53.3	220.6	None	61.7	HAMMER	FALL (in):
ŀ		STDATIM	CHANGE (ft)	BLOWS		SAMPLER	1	
	DEPTH (ft)	DEPTH	ELEVATION	PER	SAMPLE NUMBER	RECOVER'	Y RANGE	
	- o -	DEPIN	ELEVATION	0.5 ft		(ft) [%]	(ft) 0.0	
		0.4	273.5	1 4			0.0	<u>Dark b</u> _ Dark y
		1.0	272.9	5	S1	1.0 [50]		_\gravel,
				5	; <u> </u>		2.0	
		2.6	271.3	7	S2	0.5 [83]	2.0	Yellow ⊤trace c
		2.0	271.5	8/0.1			2.6	\liace c
								Moder
	- 5 -				C1	4.6 [96]		moder GNEIS
	3					4.0 [30]		run. Jo
								all other
								few be
							7.4	RQD:
							7.4	
								Hard,
								coarse moder
					C2	4.8 [100]		shallo
ŀ	– 10 –	-			02	4.0 [100]		core o
								Foliation
								loss of RQD:
							12.2	INQD.
							12.2	
								Hard,
								coarse
					СЗ	4.5 [98]		discolo
ŀ	— 15 —							other f
								Inner b RQD:
								INQD.
							16.8 16.8	
								Hard,
55 PM TB-06								black,
F								GRAN
PN					C4	4.9 [109]		closely extrem
	- 20 -							and 19
2:2	20							0.35' c
010							21.3	RQD:
20/2							21.3	
)6 1								
GP.								Hard,
IGS					C.F.	4.8 [100]		coarse
〗					C5	4.6 [100]		to clos
3BC								Foliation
肖	– 25 –	-						rtgb.
ROI							26.1	
527\							26.1	
7/13		1						
ORI								Moder graine
님					Ce	4 6 1061		extend
S/BE					C6	4.6 [96]		and ex
PROJECTS/BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010 2:22		Identifica			Die	COHESIV		_ .
307	S SL		d Split Spo poon (O.D.		Blows/ 0 -	<u>100t</u>	Consisten Very Soft	ra l
ď,	- J	Thin Ma		,	1 3	1	Soft	1

Thin Wall Tube

Open End Rod

Auger Flight

Core Barrel

Not Recorded

Undisturbed Piston

U

0

NR

90-

Soft

Stiff

Hard

5

9 -15

16

31

> 60

8

30

Medium Stiff

Very Stiff

Very Hard

ark brown and very dark greyish brown, fibrous TOPSOIL ark yellowish brown to yellowish brown, FINE SAND, some silt, trace ravel, trace coarse-medium sand, occasional fiber -SUBSOIL-

NX

1.875

FIELD CLASSIFICATION AND REMARKS

ellowish brown and greyish brown, FINE SAND, some silt, little gravel, ace coarse-medium sand, occasional rock fragment -GLACIAL TILL--APPROXIMATE BEDROCK SURFACE-

loderately hard-hard, moderately to slightly weathered, slightly to noderately fractured, grey-brownish grey and black, coarse-grained, SNEISS. Transitions into a GRANITIC GNEISS from 5.1' to the end of the un. Joints/fractures are closely spaced. Fractures of 30° at 5.5' and 5.8' w/ Il others dipping less than 30°. All joint surfaces are discolored/stained w/ ew being silt-coated. Foliation is steep to moderate, where discernible. QD: 3.3 / 4.8 = 69%

lard, slightly weathered, moderately fractured to sound, grey and black, oarse-grained, GRANITIC GNEISS. Joints/fractures are close to noderately closely spaced. Fracture of 45-50° at 10.8'. All others are hallow dipping. Severe weathering of joint surface at 12.0' extends 1/2" into ore on both sides. Occasional minor cracking of core surface is evident. oliation appears steep to moderate, is poorly defined. Noted sudden, total oss of drilling fluid at 8.0' and for the remainder of the boring. QD: 3.8 / 4.8 = 79%

lard, slightly to very slightly weathered, slightly fractured, grey and black, oarse-grained, GNEISS. Joints/fractures are closely spaced and most are scolored/stained. High-angle 80° fracture extends from 13.8' to 14.5'. All ther fractures are shallow dipping. Foliation is poorly defined, irregular. nner barrel jamming at 16.8', run terminated. QD: 3.7 / 4.6 = 80%

lard, slightly to very slightly weathered, slightly fractured to sound, grey and lack, coarse to medium grained, GNEISS. Intruded w/ coarse-grained RANITE from 18.5' to 18.9'. Joints/fractures are close to moderately losely spaced and shallow dipping. Zone of moderate weathering and xtreme fracturing from 17.1-17.2'. Minor cracking of core surface at 17.0' nd 19.3'. Foliation is shallow to moderate, where discernible. Additional 35' of core picked up from C3. QD: 4.4 / 4.5 = 98%

lard, very slightly to slightly weathered, sound to slightly fractured, grey, oarse-medium grained, GNEISSIC GRANITE. Joints are moderately close closely spaced and shallow dipping w/ exception of 40° fracture at 24.7'. oliation is very poorly defined, non-discernible. QD: 4.8 / 4.8 = 100%

loderately hard-hard, sound to moderately fractured, grey, coarse-medium rained, GNEISSIC GRANITE. Overlies a medium-grained GNEISS, which xtends to end of the run from 28.9'. Zone of moderately severe weathering

	WOR - Weigh WOH - Weigh	t of Rod	ENGL	ISH
	25 - 50 > 50	Dense Verv Dense	Trace	1% - 10%
	11 - 24	Medium Dense	Little	10% - 20%
	5 - 10	Loose	Some	20% - 35%
	0 - 4	Very Loose	Lower Case Adjective	35% - 50%
	Blows/foot	<u>Density</u>	Capitalized Soil Name	Major Component
	NON-COI	HEŠIVE SOILS	Soil Descriptions	<u>Proportion</u>
L,	iu exileme maciu	<u> </u>	0.0 . Julius are moderately	Close to y///xy

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION



BORING NO. B41

SHEET NO. 2 OF 3

STA. 118+68 OFF. RT 593

BASELINE US Route 3

ELEVATION (ft) 273.9

DES	SCF	RIPTION	1 05			e Replac		ELEVATION (ft)273.	.9
DEP (ft			CHANGE (ft) ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)	FIELD CLASSIFICATION AND REMARKS	STRATUM SYMBOL
- 30	0 —							closely spaced. Foliation is moderate within the gneiss. RQD: 3.6 / 4.8 = 75%	
- 3s	5 —				C7	4.7 [102]	30.9 30.9 35.5 35.5	Hard, fresh to very slightly weathered, sound to moderately fractured, grey and black, coarse-medium grained, GNEISS. Joints/fractures are moderately close to closely spaced. Fractures of 45° at 33.7' and 34.0' and 80-85° extending from 34.1' to 34.7'. Undulating, rough joint surface at 32.4'. Foliation is irregular throughout the run. Additional 0.1' of core picked up from C6. RQD: 3.3 / 4.6 = 72%	
					C8	4.6 [100]		Hard, fresh, sound, grey and black, coarse-medium grained, GNEISS. Joints are moderately closely spaced and shallow dipping. Quartz-rich GRANITIC INTRUSION from 36.6' to 37.7'. RQD: $4.4 / 4.6 = 96\%$	
- 40					С9	4.8 [100]	40.1	Hard, very slightly weathered to fresh, slightly fractured to sound, grey, coarse-grained, quartz-rich, GRANITIC GNEISS. Zone of moderately severe-severe weathering and extreme fracturing from 42.0' to 43.0'. Joints/fractures are close to very closely spaced and shallow dipping. Joint surfaces are very rough to rough. Foliation is non-discernible, irregular. RQD: 3.8 / 4.8 = 79%	*
<u> </u>	b —				C10	4.5 [94]	49.7	Hard, fresh to very slightly weathered, sound, grey, coarse-grained, GNEISS to 47.6'. Overlies a medium-grained GRANITIC INTRUSION. Joints/fractures are close to moderately closely spaced and shallow dipping. Moderate crack in core surface nearly through the core at 46.9'. Foliation within the gneiss is irregular. Approximately 0.3' of core left behind. RQD: 4.1 / 4.8 = 85%	
9/20/2010 2:22:55 PM TB-06	0 —				C11	4.8 [104]	49.7 54.3 54.3	Hard, fresh to very slightly weathered, sound (moderately fractured zone from 52-52.5'), grey and black, coarse-grained, GNEISS. GRANITIC INTRUSION from start of run to 50.7'. Joints/fractures are moderately close to closely spaced and shallow dipping w/ exception of 50-55° fracture at 53.5'. Moderate, well-established crack in core surface at 52.1'. Foliation is shallow to moderate, where discernible within the gneiss. Additional 0.3' of core picked up from C10. RQD: 4.5 / 4.6 = 98%	*
S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010	5 —				C12	4.5 [94]	59.1	Hard, fresh to very slightly weathered, slightly fractured to sound, grey and black, coarse-medium grained, GNEISS. Transitions into medium-fine MUSCOVITE GNEISS from 56.0' to 57.5'. Zones of increased schistosity are evident. Joints/fractures are closely spaced and shallow dipping w/ exception of 60-65° fracture at 58.0'. Traces of pyrite exist. Joint surfaces are smooth and planar at 56.3' and 56.9'. Foliation is shallow to moderate, where discernible. RQD: 4.2 / 4.8 = 88%	
TWPROJECTS/BEDFORD/1	0 -				C13	4.5 [107]	63.3 63.3	Hard, fresh, sound, grey and black, coarse-grained, GRANITIC GNEISS. Intruded w/ medium-grained, quartz-rich, GRANITE from 59.3' to 61.8'. PEGMATITE intrusion from 61.9' to 62.6'. Joints/fractures are close to moderately closely spaced and shallow dipping to near-horizontal. Additional 0.3' of core picked up from C12. In addition, left another 0.3' of core in hole. RQD: 4.2 / 4.2 = 100%	
TB-06 S:\GIN	5 —							Hard, very slightly weathered to fresh, moderately fractured to sound, grey and black, coarse-grained, GNEISS. Coarse-grained GRANITIC	

TEST BORING REPORT

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION



BORING NO. **B41**SHEET NO. ___3 OF __3

STA. __118+68 OFF. _RT_593

BASELINE ___US Route 3

PROJECT NAME BEDFORD 13527
DESCRIPTION US Route 3 Bridge Replacement

ELEVATION (ft) 273.9

LASSIFICATION AND REMARKS

- ⊢								ELEVATION (II)	
ı	DEPTH (ft)	-	CHANGE (ft)	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)	FIELD CLASSIFICATION AND REMARKS	STRATUM SYMBOL
					C14	4.3 [91]	68.0	extreme fracturing from 63.3' to 63.8'. Joints/fractures are close to moderately closely spaced and shallow dipping. Drill chatter noted from 63.3' to 63.8'. Foliation is irregular. Approximately 0.4' of core left in hole. RQD: 3.2 / 4.7 = 68%	
_	70 —				C15	4.5 [110]	68.0 68.0	Hard, very slightly weathered to fresh, slightly fractured to sound, grey and black, coarse-grained, GNEISS. Zone of moderate weathering and extreme fracturing from 68.4' to 68.7'. Joints/fractures are close to widely spaced. Foliation is moderate, where discernible. Additional 0.4' of core picked up from C14. RQD: 4.0 / 4.1 = 98%	
	75 -				C16	3.0 [100]	72.1 75.1	Hard, fresh, slightly fractured to sound, grey and black, coarse-grained, GNEISS. Joints are close to moderately closely spaced and shallow dipping. Foliation is irregular. RQD: 3.0 / 3.0 = 100%	
	73						70.1	Bottom of Exploration @ 75.1 ft (El. 198.8)	
	80 -								
	85 —								
	00								
56 PM TB-06									
0 2:22:561									
9/20/201	90 —	-							
INGS.GPJ									
UTE3BOR									
13527\RO	95 –	_							
EDFORD									
OJECTS/B									
TB-06 S.\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS\.GPJ 9/20/2010 2:22:	100 -	-							
B-06 S:\C									
\vdash \sqsubseteq		1	1		1	İ			

TEST BORING REPORT

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION

New Hammshire

PROJECT NAME **BEDFORD 13527**

TB-06

NR

Not Recorded

BRIDGE NO.

US Route 3 Bridge Replacement DESCRIPTION **GROUNDWATER EQUIPMENT** SAMPLER **CASING** CORE TYPE NW NX BOTTOM OF CASING DEPTH ELEV. воттом DATE TIME SIZE I.D. (in): OF HOLE 1.875 (ft) (ft) 1.375 3 HAMMER WT. (lb): 140 12:30 pm 8/26/10 16.3 248.1 34.5 34.5 DRILL RIG HAMMER FALL (in): 30 8/27/10 1:30 pm 16.7 247.7 65.0 65.0 CME 45-C Track rig

BORING NO. **B42** SHEET NO. OF STA. 118+10 OFF. RT 416 US Route 3 BASELINE _ 264.4 ELEVATION (ft) 8/24/10 / 8/27/10 START/END __ DRILLER J. Pierce (NHDOT) **Doug Rogers** INSPECTOR DRR CLASSIFIER 1036835/160849 EAST/NORTH (ft)

STRATUM

SYMBOL

	9/9/10	9:00 am	23.2	241.2	None	63.7	HAMMER	TYPE:	Automatic	CME 45-C Trac	CK rig EAST/NORTH (ft))103
	DEPTH	STRATUM	CHANGE (ft)	BLOWS	SAMPLE	SAMPLER	DEPTH				FION AND DEMARKO	
	(ft)	DEPTH	ELEVATION	PER 0.5 ft	NUMBER	RECOVER (ft) [%]	Y RANGE (ft)		FIEL	D CLASSIFICA	TION AND REMARKS	
	— O —	0.3	264.1	WOH			0.0	_\Dark	brown, fibrous	TOPSOIL		
		1.0	263.4	4	S1	0.7 [35]					wn, FINE SAND, some silt	, trace
				8 8				\grave	el, few fibers	-SUBSOIL-		
				10 15 21 27	S2	1.3 [65]	2.0		coarse-mediur	n sand, w/ occasio	ome silt to "silty", some-litt nal very severely weathere AL TILL-	
	- 5 -			29 33 36	S3	1.3 [65]	4.0				MEDIUM-FINE SAND, little ely weathered rock fragme	
		5.6	258.8	70			6.0		-/	APPROXIMATE BE	EDROCK SURFACE-	
	- 10 -				C1	4.2 [88]	10.8	coars coars weat GRA Joint steep from	erately hard to se-medium gra se-grained GR hered-extreme NITE. This zor /fracture surfa o and well-defii	hard, slightly weath inned, GNEISS. Fro ANITE. From 9.1' the ly fractured-grey and ne contains multiplices are heavily iron ned within the gnei 9.6' to completion	hered, sound, grey and bla equently intruded w/ thin ve to end of run, moderately s nd brownish grey-medium e vertical/high angle fractun n-stained. Foliation is mode ss. Sudden, total loss of dr	eins of severely grained res. erate to
	— 15 <i>—</i>				C2	4.9 [109]	10.8	mode INTR end of close fracti conta surfa of co	erately fracture RUSION. Becon of run. Vertical e to very closel ured coarse-m ains multiple hi	ed, brownish grey to mes coarse-graine fracture extends fr y spaced. Zone of edium grained GNI gh-angle fractures 12.7'. Much of the up from C1.	oderately weathered, slight o grey, medium-grained, G d from 11.4' to 12.2' and fr rom 11.5' to 12.1'. Joints/f very severely weathered ar EISS from 13.0' to 14.0'. T . Moderate near-vertical cr core is stained to 14.3'. Ad	RANITION 14.0 ractures and extrem this zone rack in contracts and the
58 PM TB-06					C3	4.8 [100]		Joint to 18 weat core	ellowish brown s/fractures are s.2'. Fractures	n, coarse-grained, closely spaced. Noted 50° at 19.5' and reme fracturing frolent.	d, slightly to moderately fra GRANITIC INTRUSION. ear-vertical fracture extend 60° at 16.6'. Zone of mod m 16.6' to 17.0'. Some mir	ls from ² erate se
3BORINGS.GPJ 9/20/2010 2:22:58 PM TB-06	— <u>2</u> 0 —				C4	4.8 [100]		and I PEG weat close	olack, coarse-r MATITE from hered zone fro	nedium grained, G 21.6' to 23.2' and 2 m 24.7' to 24.9'. Jo shallow dipping w/	sound to moderately fract RANITIC GNEISS. Intrude 24.2' to 24.7'. Severe to ver conts/fractures are moderat exception of 40-45° fractu	ed w/ ry sever tely clos
S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.	- 25 <u>-</u>				C5	4.8 [100]	24.9	and I coars GNE dippi cross	black, medium- se-grained PEO ISSIC GRANI ng w/ exception	-grained, GNEISS GMATITE INTRUS TE from 28.2' to 29 n of 75-80° fracture	moderately to slightly fracto approximately 26.5'. Over ION (26.5-28.2'). Coarse-Q.6'. Joints/fractures are she from 25.8' to 26.4'. This is a same zone. Foliation is in	erlies a grained, allow fracture
S:\GINTW\PROJECTS	Sampler S SL T U O A	Large Sp Thin Wa	d Split Spoo boon (O.D. all Tube bed Piston nd Rod light	= 3 in)	Blows/ 0 - 2 - 5 - 9 - 16 -	1 4 8 15	E SOILS Consisten Very Soft Soft Medium S Stiff Very Stiff		NON-COH Blows/foot 0 - 4 5 - 10 11 - 24 25 - 50 > 50	Density Very Loose Loose Medium Dense Dense Very Dense	Soil Descriptions Capitalized Soil Name Lower Case Adjective Some Little Trace	Prop Majo 35% 20% 10% 1%

> 60

Very Hard

JM-FINE SAND, little gravel, little eathered rock fragment

CK SURFACE-

ely weathered, slightly to medium-grained, GRANITIC 11.4' to 12.2' and from 14.0' to .5' to 12.1'. Joints/fractures are everely weathered and extremely rom 13.0' to 14.0'. This zone lerate near-vertical crack in core stained to 14.3'. Additional 0.4'

ntly to moderately fractured, grey ITIC INTRUSION. rtical fracture extends from 17.3' 16.6'. Zone of moderate severe 6' to 17.0'. Some minor pitting of

d to moderately fractured, grey TC GNEISS. Intruded w/ o 24.7'. Severe to very severely ractures are moderately close to otion of 40-45° fracture at 24.7'.

														// / / /
Sampler	Identification				COHES	/E SOILS			NO	N-C	OHESIVE SOILS	Soil Descriptions		Proportion
S	Standard Split Spo	on	Blo	ws/	<u>foot</u>	Consisten	су	Blov	vs/f	<u>oot</u>	<u>Density</u>	Capitalized Soil Na	me	Major Component
SL	Large Spoon (O.D.	= 3 in)	0	-	1	Very Soft	.	0	-	4	Very Loose	Lower Case Adject	ive	35% - 50%
Т	Thin Wall Tube		2	-	4	Soft		5	-	10	Loose	Some		20% - 35%
U	Undisturbed Pistor	1	5	-	8	Medium S	tiff	11	-	24	Medium Dense	Little		10% - 20%
0	Open End Rod		9	-	15	Stiff		25	-	50	Dense	Trace		1% - 10%
Α	Auger Flight		16	-	30	Very Stiff		> 50)		Very Dense			
С	Core Barrel		31	-	60	Hard	Γ	WO	R -	Weig	ght of Rod] FI	NGLIS	SH
			1	_				1410					100	J::

WOH - Weight of Hammer

TEST BORING REPORT

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION



 BORING NO.
 B42

 SHEET NO.
 2

 STA.
 118+10

 OFF.
 RT 416

 BASELINE
 US Route 3

PROJECT NAME BEDFORD 13527

US Route 3 Bridge Replacement

S:\GINTW\PROJECTS\BEDFORD\13527\ROUTE3BORINGS.GPJ 9/20/2010 2:22:59 PM TB-06

TB-06

_ BRIDGE NO. ____N/A

	RIPTIO			3 Bridge	e Replac	ement	BRIDGE NO. N/A BASELINE US Route 3	
DESCI			1				ELEVATION (ft) 264.4	
DEPTH (ft)	DEPTH	CHANGE (ft)	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)		STRATUN SYMBOL
						29.7 29.7	RQD: 3.9 / 4.8 = 81%	
- 30 -				C6	4.5 [94]	34.5	Hard, slightly weathered to fresh, moderately fractured to sound, grey and pinkish grey, coarse-grained, PEGMATITE INTRUSION. Zone of severe to very severe weathering and extreme fracturing from 29.7-30.2'. Joints/fractures are moderately close to closely spaced and shallow dipping w/ exception of near-vertical fracture from 31.7-32.0'. Approximately 0.3' of core was left in hole. RQD: 3.2 / 4.8 = 67%	
- 35 -				C7	4.5 [107]	34.5	Hard, very slightly weathered to fresh, slightly fractured to sound, grey and pinkish grey, coarse-grained, PEGMATITE INTRUSION. Quartz-rich GNEISSIC GRANITE from 38.0-38.6'. Joints/fractures are moderately close to closely spaced. Near-vertical fracture extends from 34.5' to 35.0'. Fractures of 60-65° at 36.7' and 40° at 38.1'. All others are shallow dipping. Approximately 0.3' of core left in hole, unable to retrieve. RQD: 3.5 / 4.2 = 83%	
- 40 -	-			C8	4.8 [107]	43.2	Hard, very slightly weathered to fresh, slightly fractured to sound, grey and black, coarse-grained, GNEISS. Joints/fractures are close to moderately closely spaced. Fractures of 60° at 41.3', 55° at 39.0' and 40° at 39.5' and 39.7'. Undulating, smooth joint surface at 41.3'. Foliation is irregular. Aditional 0.3' of core picked up from C7. RQD: 4.4 / 4.5 = 98%	
- 45 -	_			C9	4.8 [100]	48.0	Hard to moderately hard, moderately to slightly weathered, slightly fractured to sound, grey and greenish grey, coarse-grained, muscovite-rich GNEISSIC SCHIST. Entirely composed of felsic minerals. Transitions to a grey and black, SCHISTOSE GNEISS from 47.0'. Joints/fractures are close to moderately closely spaced. Fractures of 65° at 46.6', 45° at 46.1' and 35° at 45.9'. Smooth, curved joint surface at 45.9'. Foliation is moderate. RQD: 4.6 / 4.8 = 96%	
- 50 -				C10	4.8 [100]	48.0	Hard, fresh, sound, grey and black, medium-grained, GNEISS. Intruded w/ coarse-grained GRANITE from 50.1' to 51.0'. Joints are moderately close to widely spaced and shallow dipping. Foliation is shallow to moderate, where discernible. RQD: 4.8 / 4.8 = 100%	
- 55 -				C11	4.8 [100]	52.8 52.8	Hard, fresh, sound, grey and black, medium to coarse-grained, GNEISS. Intruded w/ medium-fine grained GNEISS from 56.9'. Joints/fractures are widely spaced, shallow dipping. RQD: 4.8 / 4.8 = 100%	
- 60 -				C12	4.1 [87]	<u>57.6</u>	Hard-moderately hard, very slightly weathered, slightly to moderately fractured. grey and greenish grey, coarse-medium grained, GNEISS. Joints/fractures are closely spaced. Fractures of 60° at 61.2', 70° at 59.5' and 30-35° at 60.3' and 60.8'. All others are shallow dipping to near-horizontal. Foliation is moderate to steep, where discernible. Approximately 0.6' of core left in hole, unable to retrieve. RQD: 3.1 / 4.7 = 66%	
- 65 -				C13	2.4 [89]	62.3 62.3 65.0	Hard, sound, similar to C12. Approximately 0.8' of core left in hole, unable to retrieve. Replaced inner barrel catcher, still unable to retrieve remainder of core. RQD: 2.4 / 2.7 = 89%	
00							Bottom of Exploration @ 65.0 ft (El. 199.4)	

Appendix C Asphalt Core Report



PAVEMENT CORE / BASE SOIL SAMPLE REPORT

Bureau of Materials and Research, 5 Hazen Drive, Concord, New Hampshire 03301 Phone (603) 271-3151 Fax (603) 271-8700

Project: Bedford
Project Number: 13527

Roadway: Old Rte 3

Sample Date: N/A

Sampled By:

Base Soil VC By:

Pavement VC By: M. Courser 9/16/2010

BORING		LOCATION			PAVEMENT			BASE SOIL(S)			NOTES				
(CORE)			Thickn	ess (in)	Visual Classification	Sample	Depth (ft)	Visual Classification	% Pass #4	% Pass #200					
	MM			2 1/2"	1/2 Mix										
	STA														
	NORTH	161329.4		2"	3/8 Mix										
	EAST	1036657.97													
B11	LANE		8"	2 1/4"	3/4 Mix						Approx Asphalt 8 inches				
(C11)	OFFSET		O								дриох дэрнан о піснез				
	LEFT RIGHT			1 1/4"	Penetration										
	RIGHT														
	OTHER														
	MM			2"	3/8 Mix										
	STA														
	NORTH	161228.2		1"	1/2 Mix										
	EAST	1037045.98													
B22	LANE		7"	2"	3/4 Mix						Approx Asphalt 7 inches				
(C22)	OFFSET		,								ripprox ripprair / moneo				
	LEFT			2"	Penetration										
	RIGHT														
	OTHER														
	MM			3/8"	PMST										
	STA														
	NORTH	161318.61					-	1 5/8"	3/4 Mix						
	EAST	1037077.01													
	LANE									Approx Asphalt 1 3/4 inches					
(C23)	OFFSET		_								p pp. ox / opridit 1 o/+ monoo				
	LEFT														
	RIGHT														
	OTHER														

Bedford 13527 Old Rte 3.xls



PAVEMENT CORE / BASE SOIL SAMPLE REPORT

Bureau of Materials and Research, 5 Hazen Drive, Concord, New Hampshire 03301 Phone (603) 271-3151 Fax (603) 271-8700 Project: Bedford
Project Number: 13527

Roadway: Old Rte 3

Sample Date: N/A

Sampled By:

Base Soil VC By:

Pavement VC By: M. Courser 9/16/2010

BORING	LOCATION			PAVEMENT			BASE SOIL(S)			NOTES
(CORE)	LOCATION	Thickn	ess (in)	Visual Classification	Sample	Depth (ft)	Visual Classification	% Pass #4	% Pass #200	NOTES
	MM		1 3/4"	1/2 Mix						
	STA									
	NORTH 160697.78		3 3/4"	3/8 Mixes						
	EAST 1037492.11									
B27	LANE	9 1/4"	2"	3/4 Mix						Approx Asphalt 9 1/4 inches
(C27)	OFFSET	3 1/4								Approx Asprial 5 1/4 inches
	LEFT		1 3/4"	Penetration						
	RIGHT									
	OTHER									
	MM		1 3/4"	3/8 Mix						
	STA									
	NORTH 159991		1 3/4"	1/2 Mix						
	EAST 1037797.77									
B36	LANE	7 1/2"	4"	3/4 Mix						Approx Asphalt 7 1/4 inches
(C36)	OFFSET	7 1/2								Approx Aspiral 7 1/4 inches
	LEFT									
	RIGHT									
	OTHER									

Bedford 13527 Old Rte 3.xls

Appendix D

Segment of the Surficial Geologic Map of the Manchester South Quadrangle, Hillsborough and Rockingham Counties, New Hampshire

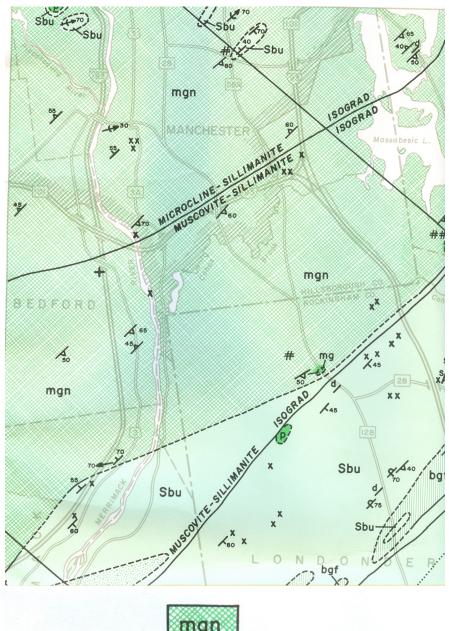


Copied from a segment of the SURFICIAL GEOLOGIC MAP OF THE MANCHESTER SOUTH QUADRANGLE, HILLSBOROUGH AND ROCKINGHAM COUNTIES, NEW HAMPSHIRE by Carl Koteff and Byron D. Stone, 2000.

- al Alluvium (Holocene) Generally fine sand and silt with minor gravel deposited in flood plains along present-day rivers and streams. As much as 25 feet thick and generally underlain by adjacent deposits. Extent of alluvium indicates most areas flooded in the past, which may be subject to future flooding.
- lb Lake-bottom deposits (Pleistocene) Clay, silt, and fine to very fine sand deposited in glacial lake Merrimack. As much as 100 ft (30 m) thick.
- st Stream-terrace deposits (Holocene and Pleistocene) Sand, silt, clay, and minor gravel deposited in terraces cut into former glacial lake deposits and till. As much as 10 ft. thick. Formed after the drainage of glacial Lake Hooksett and Merrimack.
- t Till (Pleistocene) Non-sorted to poorly sorted mixture of clay, silt, sand, pebbles, cobbles, and boulders deposited directly by glacial ice. Locally contains small irregular masses of sand and gravel. Nearly all the surface till was deposited during the last glaciation period (Wisconsinan) that overran the area. Thickness of the surface till is generally less than 15 ft.

Appendix E

Segment of the Geologic Map and Structure Sections of the Manchester Quadrangle, New Hampshire



mgn

Massabesic gneiss

Chiefly coarse to medium, foliated, compositionally banded, pink gneiss composed of microcline quartz, biotite, oligoclase, muscovite and magnetite. Minor amounts of: (1) Coarse to medium foliated compositionally banded, white gneiss, composed of oligoclase, quartz, biotite, garnet and minor sillimanite and muscovite. (2) Medium foliated green to gray amphibolite composed of actinolite, quartz, andesine, diopside, biotite and sphene.

Copied from a segment of the GEOLOGIC MAP AND STRUCTURE SECTIONS OF THE MANCHESTER QUADRANGLE NEW HAMPSHIRE, New Hampshire Department of Resources and Economic Development, by Aluru Sriramadas and Marland P. Billings, published 1966

Appendix F Visual-Manual Identification of Rock

VISUAL-MANUAL IDENTIFICATION OF ROCK

FIELD HARDNESS: A measure of resistance to scratching or abrasion.

Very hard – Cannot be scratched with knife or sharp pick. Breaking of hand specimens requires several hard blows of geologist's pick. Hard – Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.

Moderately hard – Can be scratched with knife or pick. Gouges or grooves to ¼ in. deep can be excavated by hard blow of point of a geologist's pick. Hand specimens can be detached by moderate blow.

Medium – Can be grooved or gouged 1/16 in. deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1 in. maximum size by hard blows of the point of a geologist's pick.

Soft – Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.

Very soft – Can be carved with knife. Can be excavated readily with point of pick. Pieces 1 in. or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.

WEATHERING: The action of the elements in altering the color, texture and composition of the rock.

Fresh - Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer if crystalline.

Very slight – Rock generally fresh, joints stained, some joints may show thin clay coatings, crystals in broken face show bright. Rock rings under hammer if crystalline.

Slight - Rock generally fresh, joints stained, and discoloration extends into rock up to 1 in. Joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.

Moderate – Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspar are dull and discolored; some show clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.

Moderately severe – All rock except quartz discolored or stained. In granitoid rocks, all feldspar dull and discolored and majority show kaolinization. Rock shows severe loss of strength and can be excavated with geologist's pick. Rock goes "clunk" when struck.

Severe - All rock except quartz discolored or stained. Rock "fabric" clear and evident, but reduced in strength to strong soil. In granitoid rocks, all feldspars kaolinized to some extent. Some fragments of strong rock usually left.

Very severe – All rock except quartz discolored or stained. Rock "fabric" discernible, but mass effectively reduced to "soil" with only fragments of strong rock remaining.

Complete - Rock reduced to "soil". Rock "fabric" not discernible or discernible only in small scattered locations. Quartz may be present as dikes or stringers.

ROCK CONTINUITY: Any break in a rock whether or not it has undergone relative displacement.

Extremely Fractured – Drill core stem less than 1 in. Moderately Fractured – Drill core stem 1 in. to 4 in.

Slightly Fractured – Drill core stem 4 in. to 8 in. Sound – Drill Core stem greater than 8 in.

TEXTURE: Terminology used to identify size, shape and arrangement of constituent elements.

Amorphous - Too small to be seen with naked eye.

Medium Grained – Barely seen with naked eye to 1/8 in. Coarse Grained – 1/8 in. to ½ in.

Fine Grained – Barely seen with naked eye.

Very Coarse Grained > 1/4 in.

DISCONTINUITIES: Surfaces representing breaks or fractures separating the rock mass into discrete units.

Crack - A partial or incomplete fracture.

Joint - A simple fracture along which no shear displacement has occurred. May form joint sets.

Shear – A fracture along which differential movement has taken place parallel to the surface sufficient to produce slickensides, striations or polishing. May be accompanied by a zone of fractured rock up to a few inches wide.

Fault – A major fracture along which there has been appreciable displacement and accompanied by gouge and/or a severely fractured adjacent zone.

Shear or Fault Zone – A band or zone of parallel, closely spaced shears or faults.

FRACTURES, BEDDING AND FOLIATION, SPACING AND ATTITUDE

Fractures	Bedding and Foliation	Spacing (1)	Attitude	Angle
Very close	Very thin	Less than 2 in.	Horizontal	0° - 5°
Close	Thin	2 in. – 1 ft.	Shallow or low angle	5° - 35°
Moderately close	Medium	1 ft. – 3 ft.	Moderately dipping	35° - 55°
Wide	Thick	3 ft. – 10 ft.	Steep or high angle	55° - 85°
Very wide	Very thick	More than 10 ft.	Vertical	85° - 90°

ROCK QUALITY DESIGNATION (RQD)

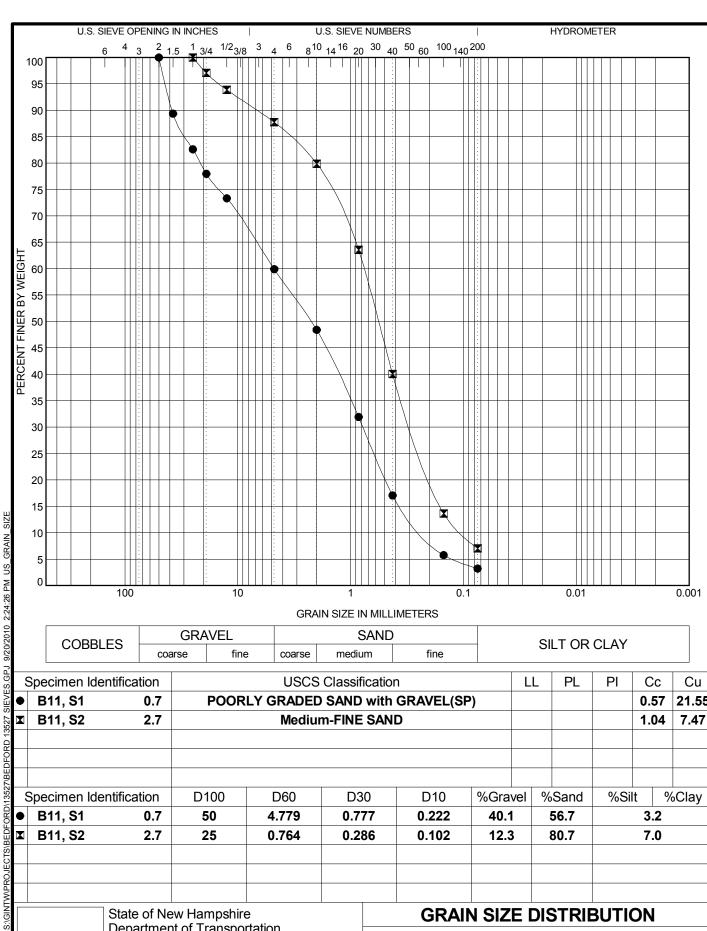
RQD in % = <u>Length of Core in Pieces 4 in. and Longer</u> X 100

Length of Run

Additional characteristics to further identify and evaluate the rock include: Type, Color, Cavities and Voids, Secondary Mineralization, Fossils, Swelling and Slaking Properties, etc. Visual-manual rock description consists of the following factors in the order presented. Example: Hard, slightly weathered, moderately fractured, gray, coarse grained CAMBRIDGE ARGILLITE, moderately close, tight, shallow dipping, smooth joints; minor shear parallel to bedding at 40 ft.; very thin, horizontal bedding; siltstone partings and calcite fillings.

NOTE: 1. Spacing – Refers to perpendicular distance between discontinuities

Appendix G Laboratory Tests

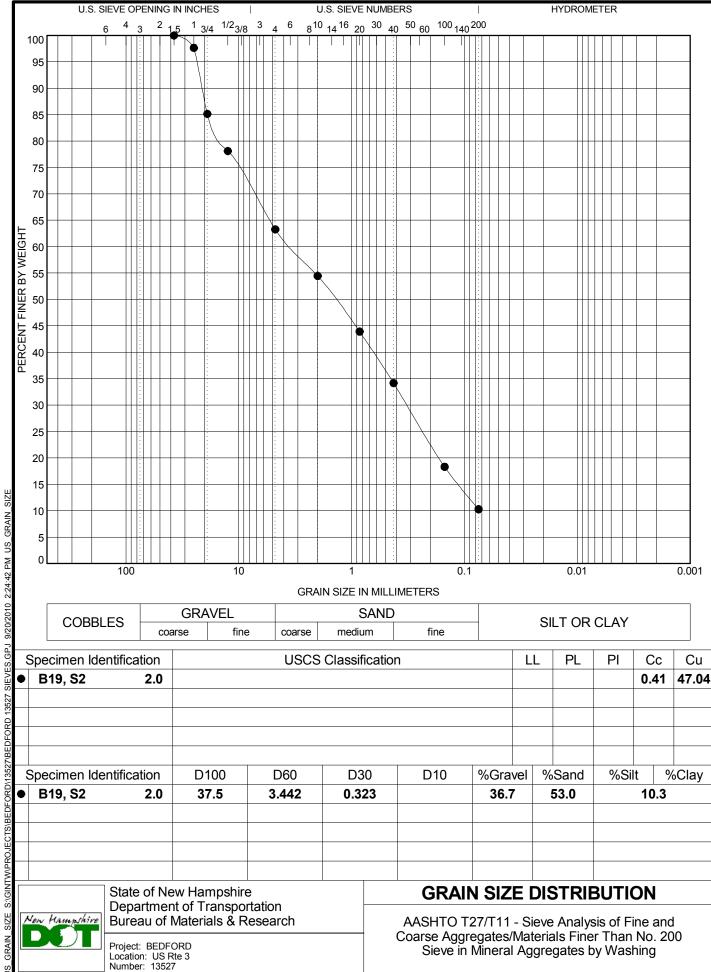


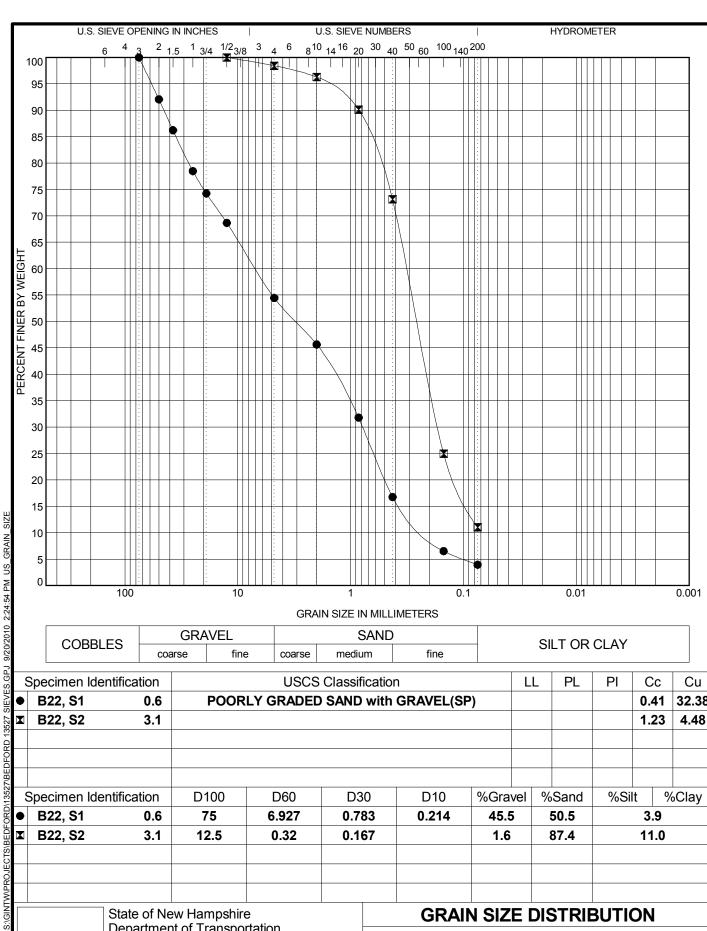
	Specimen Iden	tification		USCS	Classification	n		LL	PL	PI	Сс	Cu
•	B11, S1	0.7	POOR	LY GRADED	SAND with	GRAVEL(S	P)				0.57	21.55
	B11, S2	2.7		Mediu	m-FINE SAN	D					1.04	7.47
	Specimen Iden	tification	D100	D60	D30	D10	%Grav	el %	6Sand	%Sil	it %	6Clay
•	B11, S1	0.7	50	4.779	0.777	0.222	40.1		56.7		3.2	
X	B11, S2	2.7	25	0.764	0.286	0.102	12.3		80.7		7.0	



Project: BEDFORD Location: US Rte 3 Number: 13527

GRAIN SIZE DISTRIBUTION



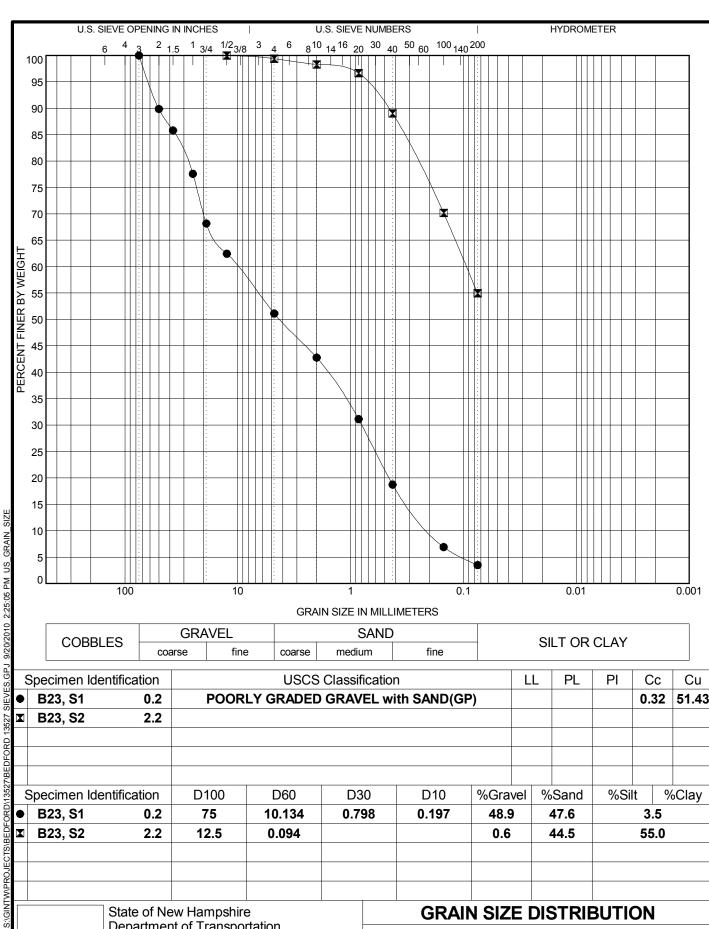


	Specimen Iden	tification		USCS	Classificatio	n		LL	PL	PI	Сс	Cu
•	B22, S1	0.6	POOR	LY GRADED	SAND with	GRAVEL(S	P)				0.41	32.38
	B22, S2	3.1									1.23	4.48
				_								
	Specimen Iden	tification	D100	D60	D30	D10	%Grave	el %	Sand	%Sil	It %	6Clay
•	B22, S1	0.6	75	6.927	0.783	0.214	45.5		50.5		3.9	
X	B22, S2	3.1	12.5	0.32	0.167		1.6		87.4		11.0	



Project: BEDFORD Location: US Rte 3 Number: 13527

GRAIN SIZE DISTRIBUTION

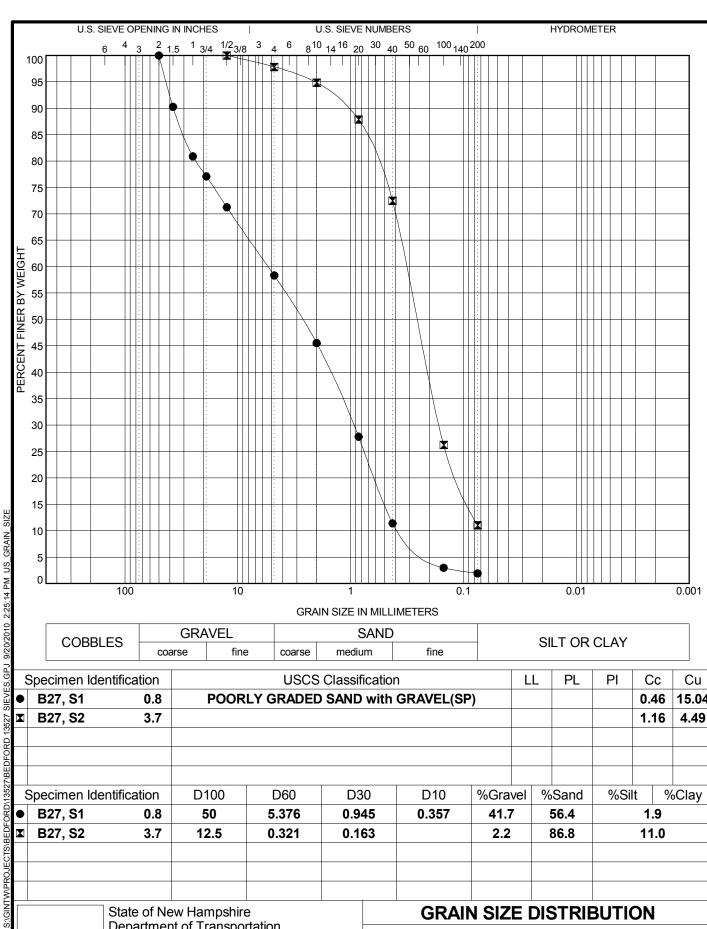


•,	Specimen Ident	tification		USCS	Classification	n		LL PL	PI	Сс	Cu
•	B23, S1	0.2	POOR	LY GRADED	GRAVEL w	ith SAND(G	iP)			0.32	51.43
×	B23, S2	2.2									
_	Specimen Ident	tification	D100	D60	D30	D10	%Grave	%Sand	%Sil	lt O	Clay
•	B23, S1	0.2	75	10.134	0.798	0.197	48.9	47.6	70011	3.5	ociay
X	B23, S2	2.2	12.5	0.094			0.6	44.5		55.0	



Project: BEDFORD Location: US Rte 3 Number: 13527

GRAIN SIZE DISTRIBUTION

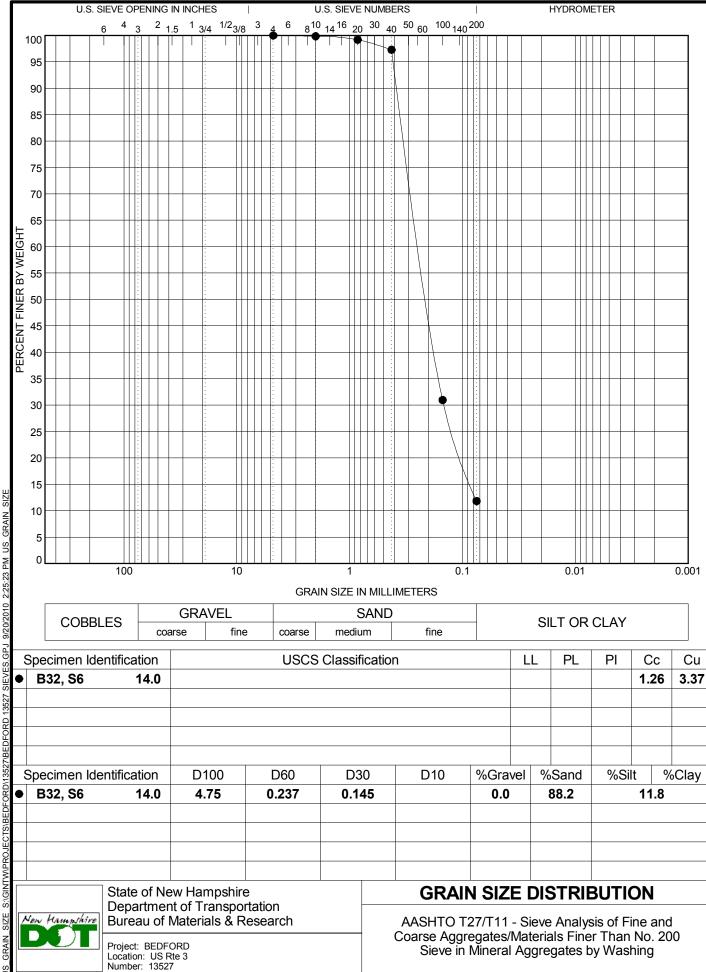


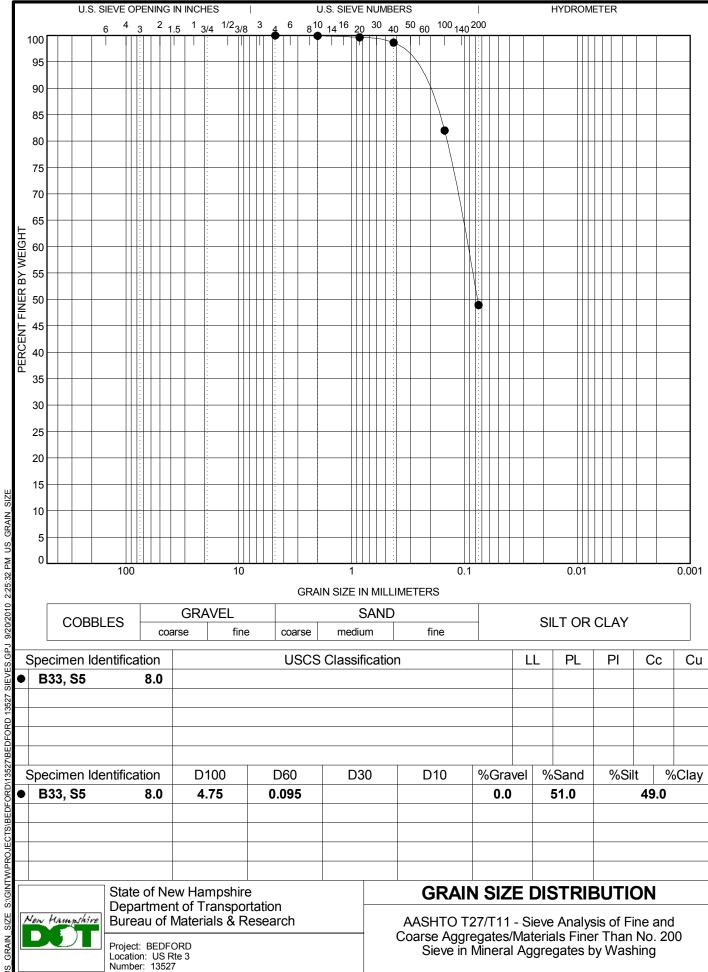
i		I										
;	Specimen Identi	ification		USCS	Classification	n		LL	PL	PI	Сс	Cu
•	B27, S1	8.0	POOR	LY GRADED	SAND with	GRAVEL(S	P)				0.46	15.04
×	B27, S2	3.7									1.16	4.49
,	Specimen Identi	ification	D100	D60	D30	D10	%Grave	el %	Sand	%Si	lt 9	6Clay
•	B27, S1	8.0	50	5.376	0.945	0.357	41.7		56.4		1.9	
×	B27, S2	3.7	12.5	0.321	0.163		2.2		86.8		11.0	

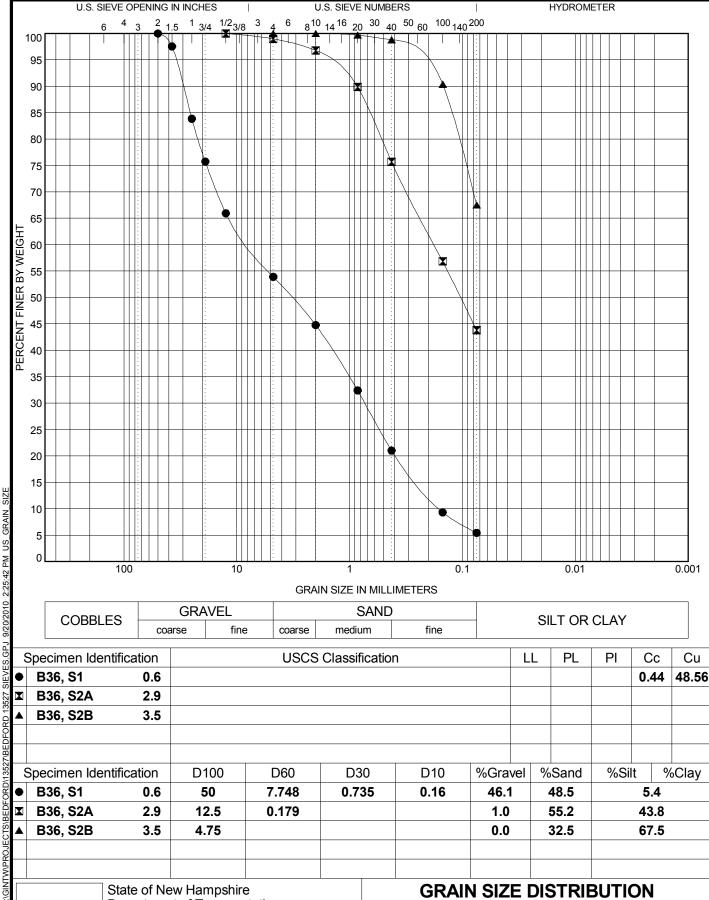


Project: BEDFORD Location: US Rte 3 Number: 13527

GRAIN SIZE DISTRIBUTION

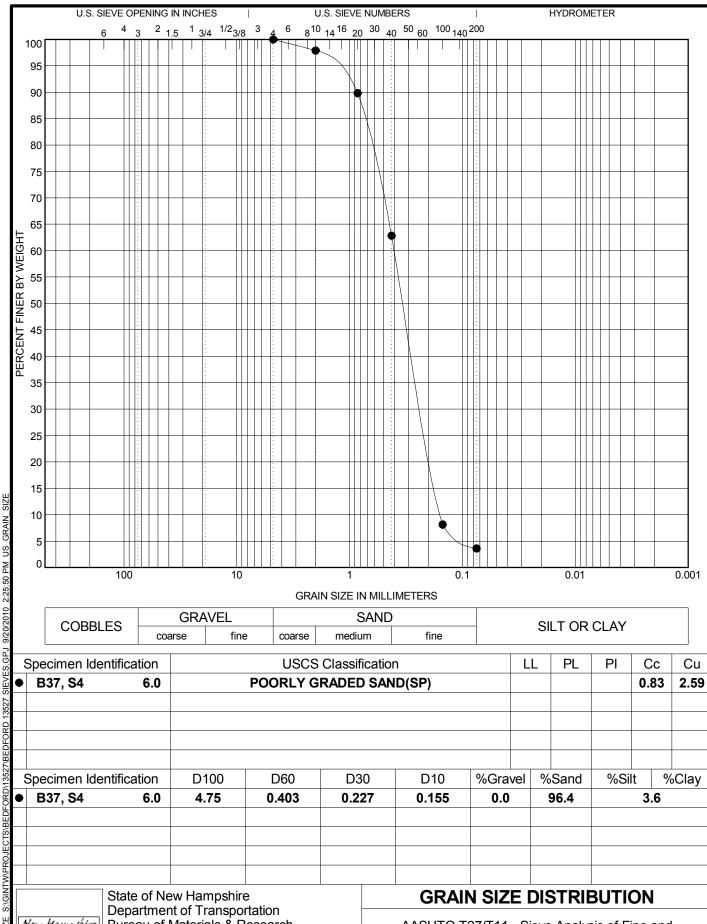








Project: BEDFORD Location: US Rte 3 Number: 13527



New Hampshire

Bureau of Materials & Research

Project: BEDFORD Location: US Rte 3 Number: 13527